

F 952  
89  
M 594

6 25716

STREET . . .  
RAILWAY . . .  
CATALOGUE

21 My '95

*Metropolitan  
Electric  
Company*

CHICAGO, U. S. A.

IMPORTERS . . .  
MANUFACTURERS  
DEALERS . . . . .

CABLE ADDRESS  
"INSULATION"

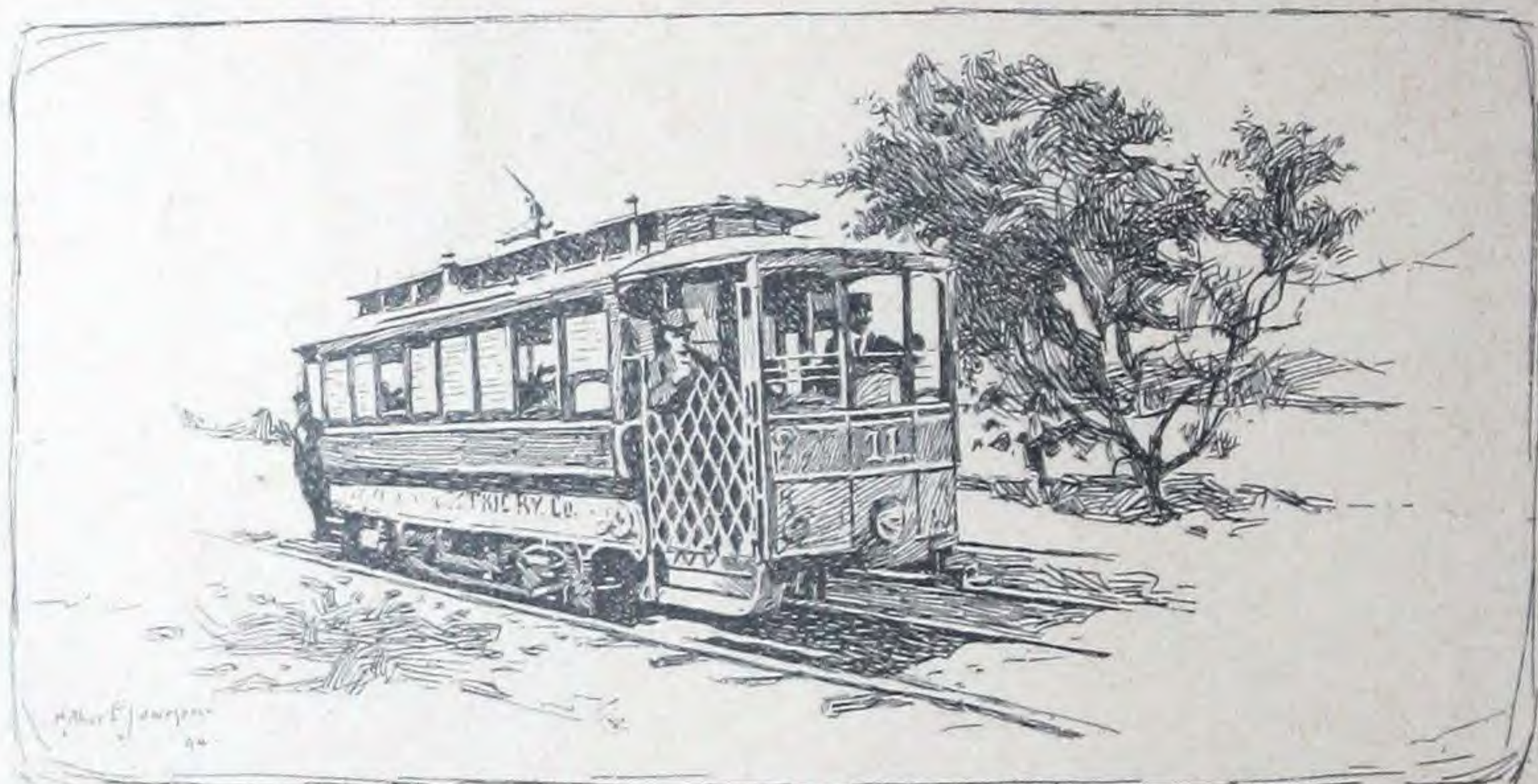














WILLIAM H. MCKINLOCK  
PRESIDENT

WALTER C. MCKINLOCK  
SECRETARY

# METROPOLITAN ELECTRIC COMPANY

186 AND 188 FIFTH AVENUE . . .

— CHICAGO, U. S. A. .

CABLE ADDRESS "INSULATION"

---

ILLUSTRATED CATALOGUE  
AND PRICE LIST OF . . . . .



ELECTRIC  
STREET  
RAILWAY  
SUPPLIES

AND  
EQUIPMENT MATERIAL



## PREFACE.

In presenting this catalogue to our friends and the trade, we offer it as a companion to our catalogue of general electrical supplies, although intended to cover an entirely distinct branch, yet allied interest. We trust our entrance into the electric railway field will be cordially recognized, as we hope, by fair treatment and close attention to the requirements of our customers, to merit their confidence.

METROPOLITAN ELECTRIC COMPANY.



## POINTS TO BE OBSERVED.

Prices are subject to change without notice.

Boxing and carting charged at cost.

As we use great care in packing, our liability for breakage ceases when we have delivered goods to carrier, and have obtained receipt for same.

In ordering, please state how goods are to be shipped.

Orders from persons unknown to us should be accompanied by a draft covering the amount of the bill. If desired to be sent C. O. D., an amount sufficient to cover express or freight charges both ways should accompany order.

Accounts not otherwise agreed upon, are payable thirty days from date of invoice.

Bills and accounts not promptly paid as above, are subject to draft on the tenth of each month.

It will expedite shipments greatly if, when ordering, you will use either trade words or list numbers.



## GENERAL WESTERN AGENTS.



Registered.

## P. &amp; B. COMPOUND

So well known to the electrical trade everywhere, is possessed of high insulating properties, is very penetrating and elastic. It adheres firmly to whatever it is applied to, and renders surfaces water, acid and alkali proof, and is a perfect insulator. Among the many purposes for which it is used, we can mention, for insulating connections, coating moldings and wires, when laid in damp places. To make cut-out boxes waterproof, coating switch boards, lamp hoods and frames, pole irons, cross arms and moldings.

It is also largely used for coating lead covered and other cables for underground use, and for overhead wires.

References: Electricians, electrical manufacturers, large electric roads everywhere.

## P. &amp; B. ARMATURE and FIELD COIL VARNISH.

Its name signifies its uses. It is made from strictly first class ingredients. The quality never varies. It will not soften up to temperature of 300° F., and is very elastic and will not flake off. Oil does not affect it.

## P. &amp; B. INSULATING TAPE

Will not vulcanize with heat, nor crack or harden, and become defective by exposure and use. Joints properly made with it will outlast, under ordinary circumstances, any wire covering. It is water, acid and alkali proof.

## THE P. &amp; B. LIQUID INSULATING COMPOUND

Received medal and diploma at the World's Fair, over all competitors.

A large and complete stock of all P. & B. products constantly on hand. Prompt shipments guaranteed.



## P. &amp; B. INSULATING COMPOUND.



For all general uses the No. 2 compound is used.

No. 1 is used where an almost immediate drier and greatest amount of penetration possible is desired.

No. 1 leaves less surface coat than No. 2.

## No. 1.

Trade Word.	List No.		Price.
Mucid	1056	Barrels of about 50 gallons -----per gallon	\$1 50
Mucic	1056A	½ barrels 25 to 30 " -----" "	1 55
Mucilage	1057	5 or 10 gallon cans -----" "	1 60
Muck	1058	2½ gallon cans, 2 in a case -----" "	1 65
Mucker	1059	1 " " 6 " " " -----" "	1 75
Muckheap	1060	½ " " 10 " " " -----" "	1 85
Muckrake	1061	Quart and pint cans -----" "	2 25

## No. 2.

Trade Word.	List No.		Price.
Mucky	1062	Barrels of about 50 gallons -----per gallon	\$1 25
Mucor	1063	½ barrel 25 to 30 " -----" "	1 35
Mucous	1064	5 or 10 gallon cans -----" "	1 40
Mud	1065	2½ gallon cans, 2 in a case -----" "	1 45
Muddied	1066	1 " " 6 " " " -----" "	1 50
Muddily	1067	½ " " 10 " " " -----" "	1 60
Muddiness	1068	Quart and pint cans -----" "	2 25

## P. &amp; B. PAINT.

This paint is not designed for insulating purposes, but is an excellent preservative for iron and wood work that is to be placed underground or submerged.

## No. 3.

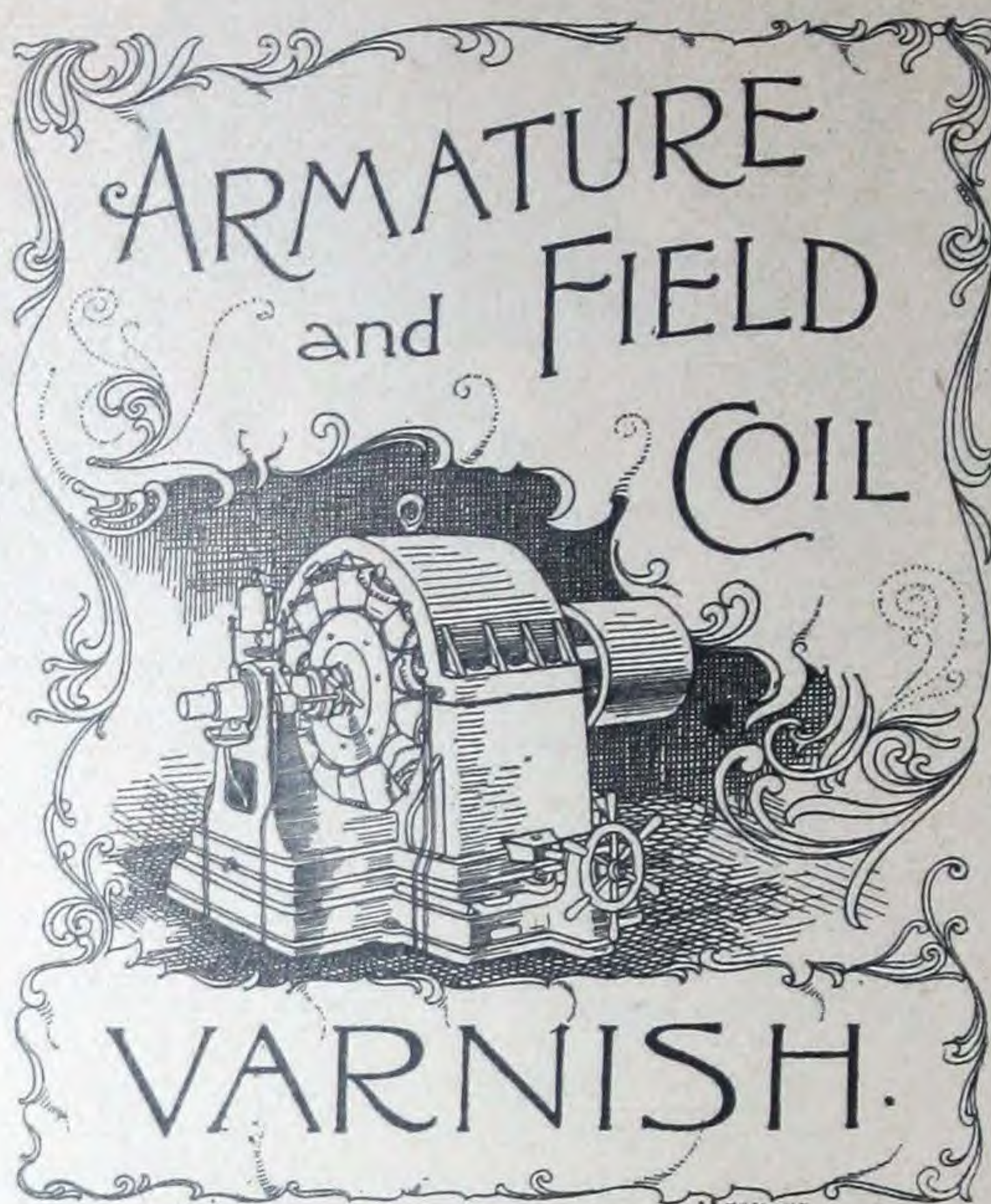
Trade Word.	List No.		Price.
Muddle	2630	In barrels of about 50 gallons -----per gallon	\$1 00
Muddled	2631	" ½ barrels, 25 to 30 " -----" "	1 05
Muddy	2632	" 5 or 10 gallon cans -----" "	1 10
Muddying	2633	" 1 gallon cans -----" "	1 20

## No. 2

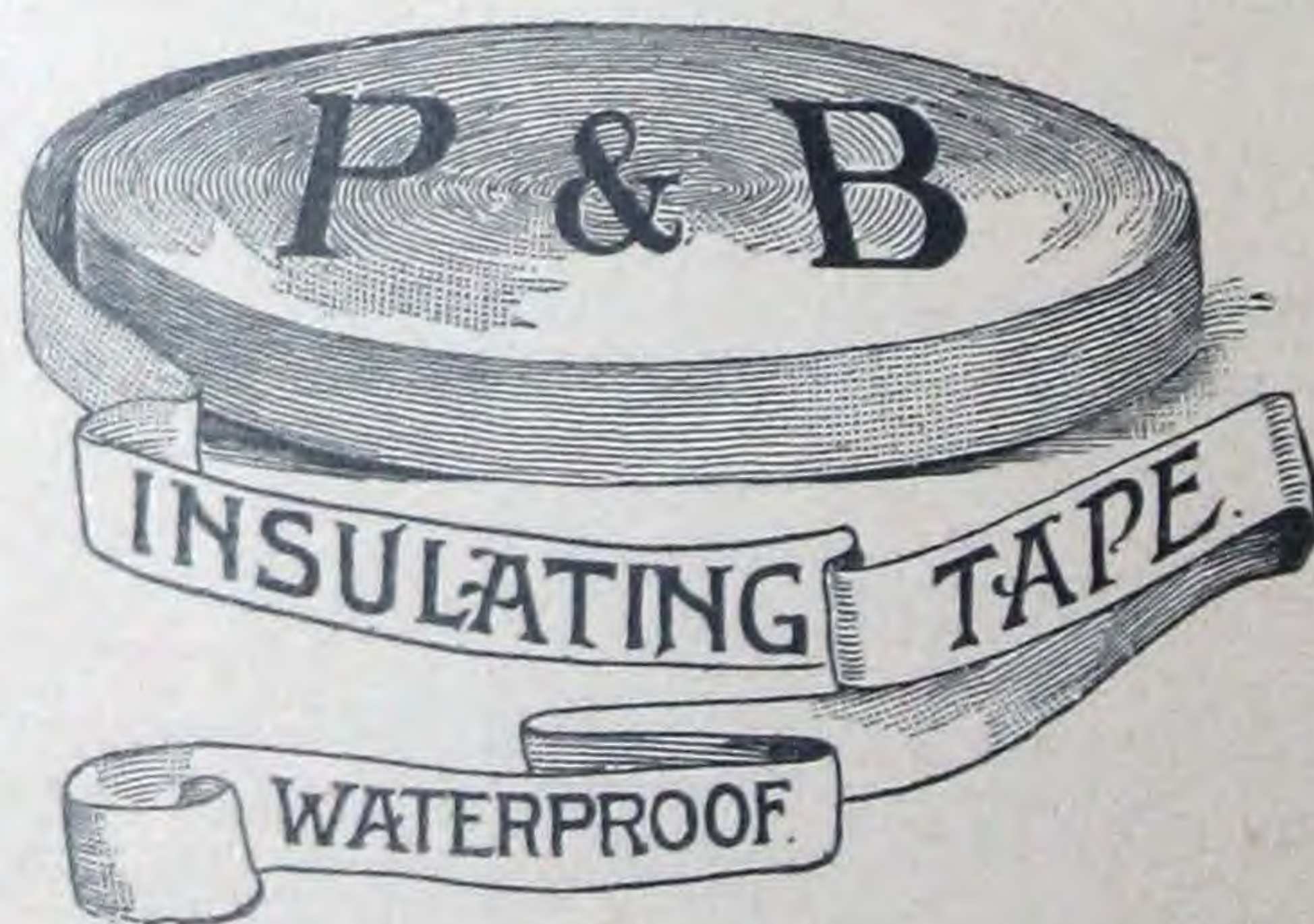
is lighter in body than the No. 3, and covers more surface. Price 10 cents per gallon more than No. 3 paint.



# P. & B. ARMATURE AND FIELD COIL VARNISH.



Trade Word.	List No.			Price.
Muddyheaded	1069	In bbls. of about 50 gallons	per gallon	\$3 00
Mudfish	1070	" ½ bbls., 25-30 gallons	" "	3 25
Mudsill	1071	" 5 or 10 gallon cans	" "	3 35
Mudsucker	1072	" 2½ gallon cans (2 in a case)	" "	3 40
Mudwall	1073	" 1 " " (6 " " " )	" "	3 60
Mudwort	1074	" ½ " " (10 " " " )	" "	3 75
Muezzin	1075	" quart " (12 " " " )	" "	4 00



Trade Word.	List No.			Price.
Muff	1076	1 lb. boxes, 1 inch wide	per pound	\$0 75
Muffin	1077	½ " " ¾ " "	" "	75
Muffle	1078	½ " " ½ " "	" "	75



## P. & B. INSULATING COMPOUND.



The P. & B. compound needs no stirring.

Packages should be shaken before taking out the compound and when taking fresh supplies. When painting is stopped, if any compound is left in the bucket, it should be poured back into the can or barrel.

If you get the compound on your hands, coal oil will take it off.

When the compound is stored in barrels, they should be occasionally turned over.

### SPECIAL.

Do not mix anything with P. & B. compound.

## P. & B. GIANT INSULATING PAPER.

For rewinding Armatures, wrapping field coils, and the heavy grade as a substitute for mica, etc.

Trade Word.	List No.		Price.
Muffler	2635	1-ply per roll of 1000 square feet, 36 inches wide----	\$4 00
Muffling	2636	2-ply " " " " " " " " " "-----	6 00
Mufflon	2637	3-ply " " " " " " " " " "-----	8 00
Mufti	2638	Little Giant Insulating Paper, in rolls 50 to 100 lbs., per pound -----	20

( Made from a very light weight of rope paper stock.)



## MOTOR CLOTH,

FOR MOTOR CURTAINS.



IT IS VERY STRONG,

IS WATER-PROOF,

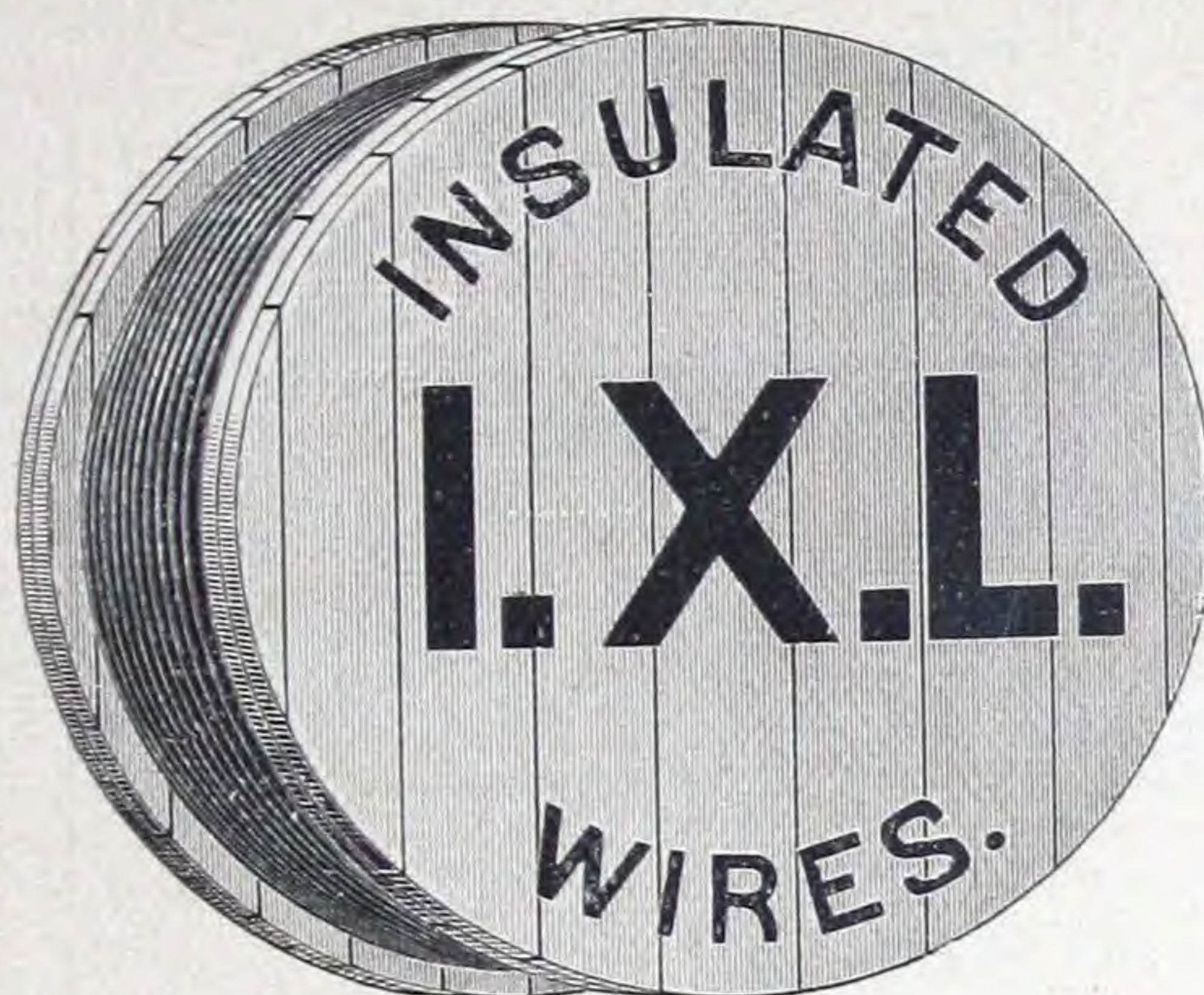
PLIABLE AND ELASTIC.

USED ON ALL LEADING ROADS  
THROUGHOUT THE COUNTRY.

Trade Word.	List No.		Price.
Mug	2634	In rolls 33 inches wide, containing 26 yards, per yard	\$0 50



## I. X. L. WEATHERPROOF LINE WIRE.



I. X. L. WEATHERPROOF WIRE has three layers of closely braided, thoroughly saturated and highly polished insulation; is absolutely weatherproof and we recommend its use for outside work while for running through foliage there is nothing better. Electric light, electric power and street railway, telephone, telegraph, police, messenger and fire alarm service companies and all others interested in the use of insulated wires for over-head or aerial work and desiring a superior article at a moderate cost will do well to confer with us before purchasing elsewhere.

## RUBBER COVERED WIRE.

We carry in stock a large quantity of rubber covered wire of all sizes, both solid and stranded conductor, in plain and braided insulation, and guarantee quality to be second to none. We can furnish cables or any special wires to conform to the requirements of our customers promptly and guarantee satisfaction. We use only the best para gum rubber, pure lake copper, and employ the most skilled workmen in the manufacture of all of our wires.

Correspondence solicited.



# PRICE LIST AND COMPARATIVE TABLE OF WEIGHTS.

SOLID.

HIGHEST GRADE TRIPLE BRAID WEATHER- PROOF WIRE.						HIGHEST GRADE RUBBER COV- ERED AND BRAIDED.			
Trade Word.	List No.	Size B. & S. Gauge.	Per 1000 Ft.	Per Mile.	Price per Pound.	Trade Word.	List No.	SOLID.	
								Weight per 1000 Ft.	Price per Ft.
Muggard .....	3332	0000	742	3918	\$0 30				
Muggent .....	3333	000	600	3168	30				
Muggy .....	3334	00	500	2640	30	Mulishly .....	107	547	\$0 61
Muggish .....	3335	0	400	2112	30	Mulishness ..	104	438	47 $\frac{1}{4}$
Mughouse .....	3336	1	300	1584	30	Mull .....	101	341	37
Mugient .....	3337	2	250	1320	30	Mullagatawny ..	98	267	29 $\frac{1}{4}$
Mugweed .....	3338	3	207	1093	30	Mullen .....	95	218	24 $\frac{1}{4}$
Mugwort .....	3339	4	161	850	31	Muller .....	92	174	19 $\frac{1}{4}$
Mulatto .....	3340	5	138	730	31	Mullet .....	89	143	16 $\frac{3}{4}$
Mulberry .....	3341	6	110	580	31	Mulligrubs ..	86	117	13 $\frac{3}{4}$
Mulch .....	3342	8	77	406	31	Mullion .....	80	68.7	08 $\frac{5}{8}$
Mulct .....	3343	10	52	275	32	Mullock .....	74	48.8	07 $\frac{1}{8}$
Mule .....	3344	12	34	180	33	Mulse .....	71	37.6	06
Muletier .....	3345	14	23	121	34 $\frac{1}{2}$	Multifid .....	68	28.1	04 $\frac{3}{4}$
Mulewort .....	3346	16	16	84	35 $\frac{1}{2}$	Multifold .....	65	18.8	03 $\frac{1}{2}$
Muliebrity .....	3347	18	12	63	36 $\frac{1}{2}$	Multiform .....	62	14.6	03
Mulier .....	3348	20				Multiped .....	59	10.8	02 $\frac{3}{4}$
Mulish .....	3349	22				Multiple .....	56	7.66	02 $\frac{1}{4}$



## PRICE LIST.

## COMPARATIVE TABLE OF WEIGHTS.

## STRANDED.

## HIGHEST GRADE RUBBER COVERED AND BRAIDED WIRE.

Trade Word.	List No.	Size B. & S. Gauge.	STRANDED.		
			Weight per 1000 Ft.	No. of Strands.	Price per Ft.
Multiplex .....	182	0000	926	19x12 B	\$1 01
Multipliable .....	179	000	658	19x11 A	71
Multiplicand .....	176	00	551	19x12 A	63
Multiply .....	170	0	442	19x15 B	52
Multiplication .....	164	1	361	19x16 B	42 $\frac{3}{4}$
Multiplicator .....	158	2	298	19x17 B	36 $\frac{1}{2}$
Multiplicity .....	152	3	251	7x11 A	27 $\frac{1}{4}$
Multiplied .....	149	4	202	7x12 A	22 $\frac{1}{2}$
Multiplier .....	146	5	161	7x15 B	18
Multiply .....	143	6	140	7x16 B	16 $\frac{3}{4}$
Multiplying .....	137	8	82.9	7x18 B	10 $\frac{1}{2}$
Multipotent .....	131	10	59.1	7x18 A	09
Multiscous .....	125	12	43.0	7x20 A	07 $\frac{1}{8}$
Multitude .....	122	14	32.3	7x23 B	06
Multivalve .....	119	16	23.6	7x24 A	05
Multoca .....	116	18	14.6	7x26 A	03 $\frac{3}{4}$
Multocular .....	113	20	11.7	7x30 B	03 $\frac{1}{8}$
Multum .....	110	22	9.83	7x30 A	02 $\frac{3}{4}$

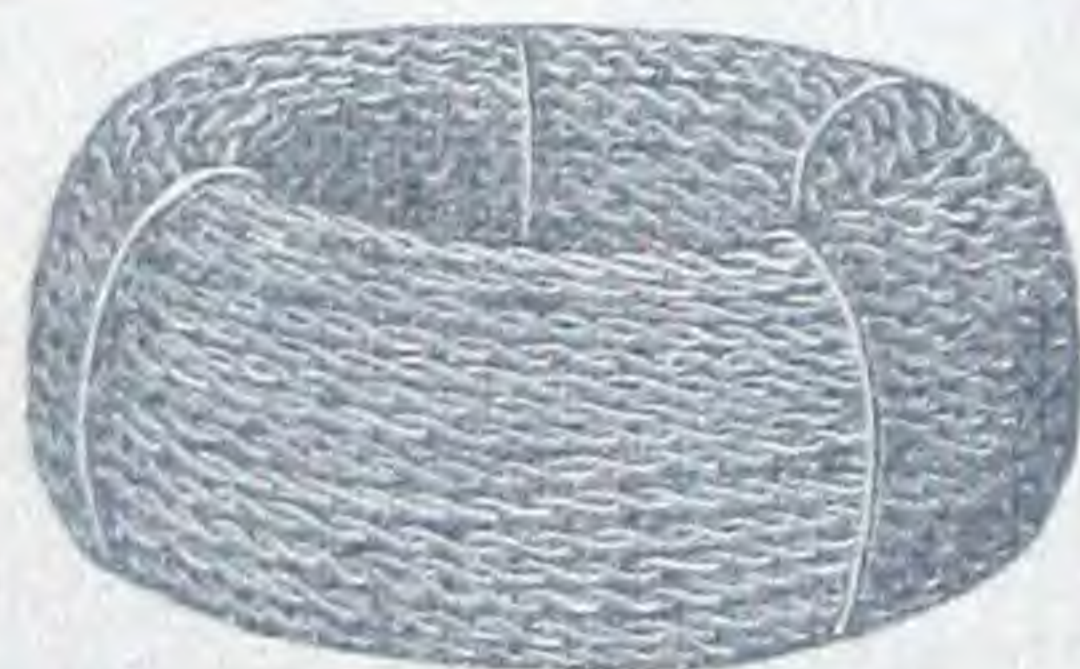
## SWITCHBOARD CABLE.

Trade Word.	List No.	Size B. & S. Gauge.	SWITCHBOARD OR VERY FLEXIBLE CABLE.		
			Weight per 1000 Ft.	No. of Strands.	Price per Ft.
Multure .....	236	0000	1100	104x17 A	\$1 38
Mum .....	233	000	890	104x18 A	1 11
Mumble .....	230	00	690	77x19 B	86 $\frac{1}{2}$
Mumbled .....	227	0	550	87x20 B	69 $\frac{1}{8}$
Mumbling .....	224	1	470	53x18 A	58 $\frac{1}{8}$
Murmur .....	221	2	370	49x19 A	47
Mummery .....	218	3	270	43x20 B	33 $\frac{5}{8}$
Mummification .....	215	4	200	49x22 B	26
Mummified .....	212	5	180	43x22 B	23 $\frac{1}{2}$
Mummiform .....	209	6	160	49x23 B	21 $\frac{1}{4}$
Mummify .....	203	8	90	49x26 B	12 $\frac{7}{8}$
Mummifying .....	197	10	60	42x26 A	11
Mumming .....	194	12	39	26x26 A	07 $\frac{5}{8}$
Mummy .....	191	14	29	28x30 B	06 $\frac{1}{4}$
Mummychog .....	188	16	21	18x30 B	04 $\frac{3}{4}$
Mump .....	185	18	14	11x30 B	03 $\frac{1}{2}$



## TROLLEY WIRE.

HARD DRAWN.					SOFT DRAWN.			Price of Either Wire.	Reels and Spools Charged at Cost.
Trade Word.	List No.	Size B. & S. Gauge.	Feet per Pound.	Pounds per 1000 Ft.	Trade Word.	List No.	Size B. & S. Gauge.		
Mumper .....	3350	0000	1.56122	640.51	Murderously	3394	0000	\$0 27	Reels and Coils.
Mumping .....	3351	000	1.9687	507.95	Mure .....	3395	000	27	
Mumpish .....	3352	00	2.4824	402.	Murex .....	3396	00	27	
Mumpishly .....	3353	0	3.1303	319.45	Muria .....	3397	0	27	
Mumps .....	3354	1	3.94714	253.34	Muriacate .....	3398	1	27	
Munch .....	3355	2	4.97722	200.91	Muriate .....	3399	2	27	
Muncher .....	3356	3	6.2765	159.32	Muriated .....	3400	3	27	
Munching .....	3357	4	7.9141	126.35	Muriatic .....	3401	4	27	
Mund .....	3358	5	9.97983	100.20	Muricalcite .....	3402	5	27	
Mundane .....	3359	6	12.5847	79.462	Muricate .....	3403	6	27	
Mundantly .....	3360	7	15.8696	63.013	Muricated .....	3404	7	27	5 and 10 Pound Spools.
Mundation .....	3361	8	20.0097	49.976	Muricite .....	3405	8	27	
Mundatory .....	3362	9	25.229	39.636	Muriform .....	3406	9	28	
Mundic .....	3363	10	31.8212	31.426	Murine .....	3407	10	28	
Mundificant .....	3364	11	40.1202	24.924	Murt .....	3408	11	29	
Mundification .....	3365	12	50.5906	19.766	Murkily .....	3409	12	29	
Mundificative .....	3366	13	63.7948	15.674	Murky .....	3410	13	30	
Mundify .....	3367	14	80.4415	12.435	Murmur .....	3411	14	30	
Mundivagant .....	3368	15	101.4365	9.859	Murmurer .....	3412	15	31	
Mundungas .....	3369	16	127.12	7.819	Murmuring .....	3413	16	31	
Muneray .....	3370	17	161.29	6.199	Murmurous .....	3414	17	31½	1 Pound Spools.
Munerate .....	3371	18	203.374	4.916	Murr .....	3415	18	32	
Mungrel .....	3372	19	256.468	3.899	Murrair .....	3416	19	32	
Municipal .....	3373	20	323.399	3.094	Murre .....	3417	20	33	
Municipality .....	3374	21	407.815	2.452	Murrline .....	3418	21	34	
Munificate .....	3375	22	514.193	1.945	Murrian .....	3419	22	38	
Munificence .....	3376	23	648.452	1.542	Murza .....	3420	23	40	
Munificent .....	3377	24	817.688	1.223	Musard .....	3421	24	43	
Munificently .....	3378	25	1031.038	.9699	Muscadel .....	3422	25	46	
Muniment .....	3379	26	1300.180	.7692	Muscadine .....	3423	26	54	
Munite .....	3380	27	1639.49	.6099	Muscatel .....	3424	27	62	1 Pound Spools.
Munition .....	3381	28	2067.364	.4837	Muscat .....	3425	28	67	
Munify .....	3382	29	2606.959	.3835	Muscle .....	3426	29	73	
Mungeet .....	3383	30	3287.084	.3002	Muscoid .....	3427	30	82	
Munnion .....	3384	31	4414.49	.2413	Muscosity .....	3428	31	95	
Muns .....	3385	32	5226.915	.1913	Muscovado .....	3429	32	1 30	
Murage .....	3386	33	6590.41	.1517	Muscular .....	3430	33	1 50	
Mural .....	3387	34	8312.8	.1204	Muscularity .....	3431	34	1 70	
Murder .....	3388	35	10481.77	.0956	Muscularly .....	3432	35	2 00	
Murdered .....	3389	36	13214.16	.0757	Musculite .....	3433	36	3 25	
Murderer .....	3390	37	16659.97	.06003	Musculous .....	3434	37	5 75	1 Pound Spools.
Murderess .....	3391	38	21013.25	.04758	Muse .....	3435	38	10 00	
Murdering .....	3392	39	26496.237	.03755	Mused .....	3436	39	15 00	
Murderous .....	3393	40	33420.63	.02992	Museful .....	3437	40	20 00	



## INCANDESCENT LAMP CORD.

Conductors are composed of fine wires twisted together, insulated with rubber, and covered with an ornamental braid of silk or cotton.

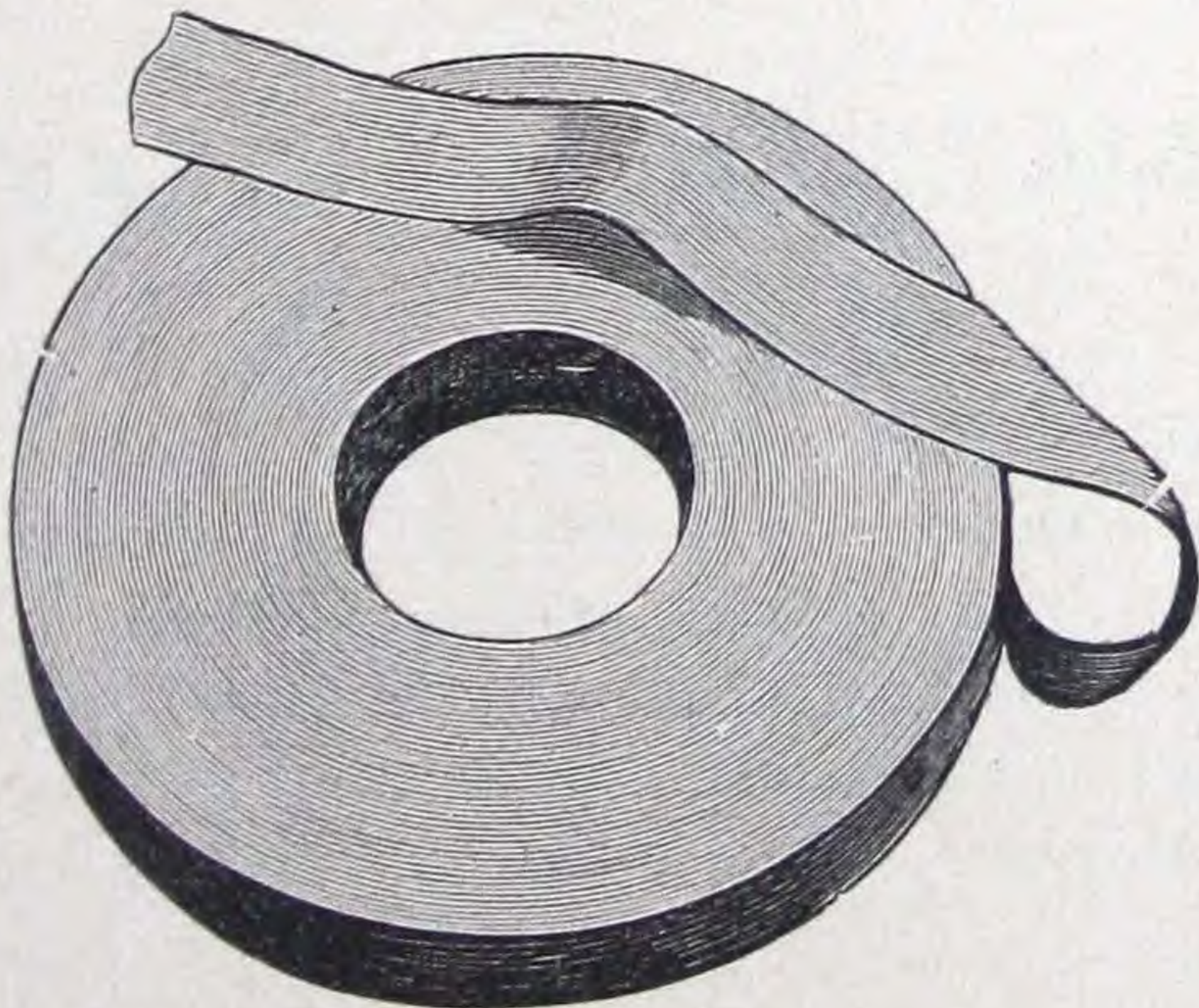
Trade Word. (Silk.)	List No.	Silk Covered per Yd.	Equal in Capacity to	Conductor.	Cotton Covered per Yd.	List No.	Trade Word. (Cotton.)
Museless .....	3438	\$0 40	No. 12 B. & S.	60 No. 30 wires	\$0 32	3444	Music
Muser .....	3439	31	" 14 "	40 " 30 "	29	3445	Musical
Muset .....	3440	19	" 16 "	25 " 30 "	12	3446	Musician
Museum .....	3441	16	" 18 "	16 " 30 "	9	3447	Musing
Mush .....	3442	12	" 20 "	10 " 30 "	7	3448	Musk
Mushroom .....	3443	22	" 22 "	14 " 34 "	7	3449	Musket



LEAD COVERED WIRE.  
SOLID.

Trade Word.	List No.	Gauge of Cond.	Diameter of Insulation.	Thickness Lead Walls.	Approx. Weight per Mile.	Insulation Resistance per Mile.	Price per Foot.
		A. W. G.	Inches.	Inches.	Pounds.	Megohms.	
Teraph.....	259A	00	.660	.080	9676	1000	\$0 98
Saturn.....	259	00	.775	.090	11245	1500	1 19
Teraphim.....	260A	0	.600	.075	7330	1000	79 <sup>7</sup> / <sub>8</sub>
Saturnist.....	260	0	.720	.080	9166	1500	96
Tercine.....	261A	1	.515	.070	6675	1000	68 <sup>5</sup> / <sub>8</sub>
Saturnite.....	261	1	.650	.078	7883	1500	82 <sup>1</sup> / <sub>4</sub>
Teredo.....	262A	2	.430	.065	4656	1000	50 <sup>1</sup> / <sub>8</sub>
Satyr.....	262	2	.600	.075	6944	1500	71 <sup>1</sup> / <sub>4</sub>
Tergum.....	263A	3	.410	.060	4107	1000	43 <sup>5</sup> / <sub>8</sub>
Satyric.....	263	3	.550	.070	5919	1500	60 <sup>1</sup> / <sub>2</sub>
Termfee.....	264A	4	.360	.055	3305	1000	35 <sup>1</sup> / <sub>8</sub>
Satyrion.....	264	4	.500	.0625	5005	1500	48 <sup>3</sup> / <sub>8</sub>
Terminer.....	265A	5	.330	.050	2808	1000	29 <sup>3</sup> / <sub>8</sub>
Sauter.....	265	5	.460	.060	4304	1500	42 <sup>3</sup> / <sub>4</sub>
Terminus.....	266A	6	.300	.050	2528	1000	24
Sauria.....	266	6	.425	.050	3466	1500	34 <sup>1</sup> / <sub>8</sub>
Terminthus.....	267A	8	.230	.045	1761	1000	17 <sup>1</sup> / <sub>4</sub>
Sauroid.....	267	8	.325	.047	2403	1500	23 <sup>1</sup> / <sub>2</sub>
Termite.....	268A	10	.204	.040	1380	1000	13 <sup>5</sup> / <sub>8</sub>
Sausage.....	268	10	.284	.040	1876	1500	18
Termor.....	269A	12	.165	.035	967	1000	9 <sup>3</sup> / <sub>4</sub>
Sausswrite.....	269	12	.259	.035	1507	1500	14 <sup>1</sup> / <sub>2</sub>
Termagancy.....	270A	14	.150	.030	761	1000	7 <sup>7</sup> / <sub>8</sub>
Savable.....	270	14	.238	.03125	1226	1500	11 <sup>7</sup> / <sub>8</sub>
Termagant.....	271A	16	.134	.025	576	1000	6 <sup>1</sup> / <sub>4</sub>
Savage.....	271	16	.220	.030	1063	1500	10 <sup>1</sup> / <sub>4</sub>
Terminus.....	272A	18	.128	.025	512	1000	5 <sup>5</sup> / <sub>8</sub>
Savagery.....	272	18	.203	.025	832	1500	8 <sup>1</sup> / <sub>2</sub>

“MAC” RUBBER TAPE.



Trade Word.	List No.		Price.
Musketeer	1054	½ lb. rolls ¾ inch .....per pound	\$2 00



LEAD COVERED WIRE.

STRANDED.

Trade Word.	List No.	Conductor.		Diameter of Insulator.	Thickness of Walls.	Approx. Weight per Mile.	Insulator Resistance per Mile.	Price per Foot.
		A. W. G.	A-A. W. G. B-B. W. G.					
				Inches.	Inches.	Pounds.	Megohms.	
Tennis	273 A	0000	19x12 B	.850	.095	13393	1000	\$1 58
Savagism	273	0000	19x12 B	1.100	.100	17320	1500	1 99
Tenon	274 A	000	19x11 A	.750	.090	10705	1000	1 22
Savant	274	000	19x11 A	.950	.095	13980	1500	1 55
Tenor	275 A	00	19x12 A	.700	.085	9515	1000	1 08
Savin	275	00	19x12 A	.870	.095	12513	1500	1 35
Tenrec	276 A	0	19x15 B	.650	.080	8050	1000	90 $\frac{1}{4}$
Sawyer	276	0	19x15 B	.775	.090	10752	1500	1 13
Tense	277 A	1	19x16 B	.600	.075	7016	1000	78 $\frac{3}{8}$
Saxatile	277	1	19x16 B	.720	.080	8812	1500	94
Tension	278 A	2	19x17 B	.550	.070	5957	1000	66 $\frac{3}{8}$
Saxicavous	278	2	19x17 B	.650	.078	7615	1500	80
Tensive	279 A	3	7x11 A	.470	.065	4891	1000	52
Saxifrage	279	3	7x11 A	.600	.075	6801	1500	69 $\frac{3}{4}$
Tensome	280 A	4	7x12 A	.400	.060	3901	1000	41 $\frac{1}{2}$
Saxon	280	4	7x12 A	.570	.070	6005	1500	60 $\frac{7}{8}$
Tensor	281 A	5	7x15 B	.360	.055	3220	1000	32 $\frac{7}{8}$
Saxonism	281	5	7x15 B	.500	.0625	4910	1500	47 $\frac{5}{8}$
Tensure	282 A	6	7x16 B	.340	.050	2780	1000	29 $\frac{3}{8}$
Saxonist	282	6	7x16 B	.540	.060	4246	1500	42 $\frac{1}{2}$
Tented	283 A	8	7x18 B	.280	.050	2030	1000	20 $\frac{3}{4}$
Scabbard	283	8	7x18 B	.425	.050	3328	1500	33 $\frac{1}{2}$
Tenter	284 A	10	7x18 A	.220	.045	1630	1000	16 $\frac{1}{2}$
Scaffold	284	10	7x18 A	.325	.047	2424	1500	23 $\frac{1}{4}$
Tenting	285 A	12	7x20 A	.180	.040	1162	1000	11 $\frac{3}{4}$
Scalado	285	12	7x20 A	.280	.040	1826	1500	17 $\frac{3}{4}$
Tenuity	286 A	14	7x23 B	.165	.035	933	1000	9 $\frac{3}{4}$
Scalariform	286	14	7x23 B	.259	.035	1470	1500	14 $\frac{1}{4}$
Tenuous	287 A	16	3x22 B	.148	.030	736	1000	7 $\frac{1}{2}$
Salary	287	16	3x22 B	.238	.03125	1197	1500	11 $\frac{3}{4}$
Tenure	288 A	18	3x23 B	.134	.025	570	1000	6 $\frac{1}{4}$
Scaldic	288	18	3x23 B	.220	.03	1057	1500	10 $\frac{1}{2}$

"MAC" FRICTION TAPE.



Upon examination and comparison will show for itself that it has a larger proportion of good India rubber in its composition than any other cloth tape in the market.

It has very high abrasive and insulating qualities, will not oxidize the wire and will maintain its adhesive qualities under all climatic changes. Put up in 3/4 inch widths in 1/2 pound packages, white and black. Special widths to order.

Trade Word.	List No.		Price.
Muskatoon	1055	1/2 lb. rolls 3/4 inch wide.....per pound	\$1 40





## PRICE LIST.

Trade Word.	List No.	Safe Carrying Capacity. Amperes.	*Best Lengths for Use and Fusing Currents for such Lengths.		Feet per lb.		Weight per 100 ft.		Price per Pound.	Price per Foot.
			Inches.	Amperes.	Ft.	In.	Lbs.	Oz.		
Musketry	685	$\frac{1}{4}$	1	$\frac{3}{4}$	-----	-----	-----	-----	-----	\$0 00 $\frac{3}{4}$
Muskiness	686	$\frac{1}{2}$	1	$1\frac{1}{2}$	-----	-----	-----	-----	-----	00 $\frac{3}{4}$
Muskmelon	687	$\frac{3}{4}$	1	$2\frac{1}{4}$	-----	-----	-----	-----	\$5 00	00 $\frac{3}{4}$
Muskrat	688	1	$1\frac{1}{4}$	3	1025	-----	-----	$1\frac{1}{2}$	4 00	01
Musquash	689	2	$1\frac{1}{2}$	5	680	-----	-----	3	3 50	01 $\frac{1}{4}$
Musky	690	3	$1\frac{1}{2}$	7	445	-----	-----	5	3 25	01 $\frac{1}{2}$
Muslin	691	4	$1\frac{3}{4}$	9	290	-----	-----	7	3 00	01 $\frac{1}{2}$
Musmon	692	5	$1\frac{3}{4}$	10	168	-----	-----	9	2 50	02
Musquito	693	6	2	12	145	-----	-----	11	2 00	02 $\frac{1}{4}$
Mussite	694	7	2	13	122	-----	-----	13	2 00	02 $\frac{1}{4}$
Musselman	695	8	2	15	105	-----	-----	15	1 50	02 $\frac{1}{2}$
Mustache	696	10	$2\frac{1}{4}$	17	82	-----	1	3	1 50	02 $\frac{3}{4}$
Mustachio	697	12	$2\frac{1}{4}$	20	66	-----	1	8	1 50	03
Mustard	698	14	$2\frac{1}{4}$	23	56	-----	1	13	1 50	03 $\frac{1}{4}$
Mustee	699	15	$2\frac{1}{4}$	24	53	-----	1	15	1 50	03 $\frac{1}{2}$
Muster	700	16	$2\frac{1}{2}$	25	47	6	2	2	1 50	04
Musty	701	20	$2\frac{1}{2}$	30	37	4	2	11	1 50	04 $\frac{3}{4}$
Mustability	702	25	$2\frac{3}{4}$	37	28	4	3	9	1 50	06 $\frac{1}{2}$
Mutable	703	30	$2\frac{3}{4}$	43	23	8	4	3	1 50	08 $\frac{1}{2}$
Mutage	704	35	3	49	19	10	5	1	1 50	09
Mutation	705	40	3	56	17	-----	5	14	1 25	10
Mute	706	50	3	69	13	7	7	5	1 25	11 $\frac{1}{2}$
Muteness	707	60	$3\frac{1}{4}$	81	10	6	9	11	1 25	14 $\frac{1}{2}$
Mutilate	708	70	$3\frac{1}{4}$	93	9	-----	11	2	1 25	15
Mutilated	709	75	$3\frac{1}{2}$	99	7	10	12	12	1 25	18 $\frac{1}{2}$
Mutilation	710	80	$3\frac{1}{2}$	106	7	2	13	14	1 25	20
Mutilator	711	100	4	129	5	-----	19	12	1 25	25
Mutilous	712	125	$4\frac{1}{4}$	158	3	10	26	-----	1 00	28
Mutine	713	150	$4\frac{1}{2}$	187	3	-----	32	12	1 00	33
Mutineer	714	175	$4\frac{1}{2}$	215	2	6	39	8	1 00	37
Muting	715	200	$4\frac{3}{4}$	243	2	2	46	-----	1 00	43
Mutinous	716	250	$4\frac{3}{4}$	298	1	10	58	8	1 00	55
Mutiny	717	300	5	351	1	5	72	6	1 00	65
Mutter	718	350	$5\frac{1}{4}$	402	1	3	85	5	1 00	75
Muttered	719	400	$5\frac{1}{4}$	450	1	1	98	-----	1 00	84
Mutton	720	450	$5\frac{1}{2}$	500	-----	11	110	-----	1 00	92
Mutual	721	500	6	550	-----	10	124	-----	1 00	1 00

\*If used in longer lengths the fusing points will not vary. If shorter, lengths should be specified.



## MAGNET WIRE.

COTTON COVERED.

B. & S. No.	SINGLE.			DOUBLE.			B. & S. No.	SINGLE.			DOUBLE.		
	Trade Word.	List No.	Per Lb.	Trade Word.	List No.	Per Lb.		Trade Word.	List No.	Per Lb.	Trade Word.	List No.	Per Lb.
0000	Mutuality	311	\$0 44	Myrlameter	3450	\$0 45	In full coils.	Mynchen	314 J	\$0 44	Mysterious	3460	\$0 47
000	Mutually	311 A	43	Myriapod	3451	45		Mynheer	314 K	44	Mysterize	3461	47
00	Mutation	311 B	44	Myriarch	3452	45		Myographical	315 L	46	Mystery	3462	48½
0	Mutule	311 C	44	Myricin	3453	45		Myologist	315 M	46	Mystic	3463	48½
1	Mux	312 D	43	Myrmidon	3454	43½		Myology	316 N	48	Mystical	3464	52
2	Muzzle	312 E	43	Myropolist	3455	43½		Myope	316 O	48	Mysticism	3465	52
3	Muzzled	312 F	43	Myrrh	3456	43½	In full coils.	Myotomy	317 P	54	Mystified	3466	58
4	Muzzling	312 G	43	Myrrhine	3457	43½		Myriad	317 Q	54	Myth	3467	58
5	Muzzy	313 H	44	Myrtle	3458	45		Myrgram	318	56	Mythic	3468	60
6	Mylodon	313 I	44	Myrus	3459	45							

## SILK COVERED.

## COTTON COVERED.

B. & S. No.	SINGLE.			DOUBLE.			B. & S. No.	SINGLE.			DOUBLE.		
	Trade Word.	List No.	Per Lb.	Trade Word.	List No.	Per Lb.		Trade Word.	List No.	Per Lb.	Trade Word.	List No.	Per Lb.
16	Mythical	319	\$0 56	Niggard	3469	\$0 60	In 1 lb. spools.	Node	3494	\$1 12	Nucleus	3519	\$1 53
17	Mythologic	320	59	Niggardly	3470	65½		Noetic	3495	1 12	Nude	3520	1 53
18	Mythologist	321	59	Niggle	3471	65½		Nomad	3496	1 15	Nudge	3521	1 57
19	Mythology	322	64	Nigh	3472	71½		Nomadic	3497	1 15	Nndity	3522	1 57
20	Myxon	323	64	Nightcap	3473	71½		Nominal	3498	1 18	Nugation	3523	1 61
21	Nibble	324	70	Nighted	3474	88		Nominate	3499	1 20	Nugatory	3524	1 63
22	Nibbling	325	76	Nightgown	3475	95	In 1 lb. spools.	Nominated	3500	1 30	Numb	3525	1 76
23	Nicety	326	83	Nimble	3476	1 05		Nomination	3501	1 42	Numeric	3526	1 93
24	Nichar	327	90	Nimbleness	3477	1 14		Nominative	3502	1 56	Numerical	3527	2 13
25	Niche	328	1 00	Nimbus	3478	1 27		Nominee	3503	1 81	Numerist	3528	2 48
26	Niched	329	1 10	Nimmer	3479	1 38		Nominor	3504	2 10	Numerous	3529	2 88
27	Nick	330	1 25	Nincompoop	3480	1 57		Nopal	3505	2 25	Numps	3530	3 07
28	Nicker	331	1 35	Nipple	3481	1 69	In 1 lb. spools.	Norium	3506	2 38	Numskull	3531	3 23
29	Nicknacks	332	1 50	Nisan	3482	1 89		Normal	3507	2 75	Nun	3532	3 76
30	Nickname	333	1 65	Nitrate	3483	2 07		Norse	3508	2 95	Nuncia	3533	4 02
31	Nicotin	334	1 80	Nitric	3484	2 23		Nosegay	3509	3 25	Nuptial	3534	4 40
32	Nictate	335	1 95	Nitrogen	3485	2 28		Nosle	3510	3 45	Nurse	3535	4 53
33	Nide	336	2 40	Nitter	3486	2 85		Notion	3511	3 90	Nursery	3536	5 10
34	Nidget	337	2 85	Nizam	3487	3 42	In 1 lb. spools.	Notional	3512	4 10	Nursling	3537	5 30
35	Nidor	338	3 25	Nob	3488	3 88		Notorious	3513	5 85	Nutgall	3538	7 78
36	Nidorous	339	4 37	Nobility	3489	4 93		Nourish	3514	7 00	Nuzzle	3539	8 88
37	Nidulant	340	6 75	Noble	3490	7 25		Novel	3515	11 00	Nymph	3540	13 63
38	Nidus	341	9 00	Nobly	3491	9 50		Novelty	3516	13 00	Nymphish	3541	14 50
39	Niells	342	11 00	Nodder	3492	12 00		Novice	3517	15 00	Nymphean	3542	18 00
40	Niffle	343	13 00	Noddle	3493	15 00		Noxious	3518	20 00	Nymphia	3543	23 00

\* In full coils.

† In 5 to 10 lb. lots.

‡ In 2 to 5 lb. lots.



## SPAN WIRE.

USED FOR GUYING POLES AND FOR SPAN WIRE IN ELECTRIC LIGHT AND RAILWAY SERVICE.

GALVANIZED STEEL.

This strand is composed of seven wires twisted together into a single strand.

## LIST PRICE.

Trade Word.	List No.	7 Wires. No.	Approximate Diameter in inches.	Price per 100 ft.	Weight per 100 ft.	Tensile Strength in Pounds.
Pledge	422	8	$\frac{1}{2}$	\$4 40	52	8320
Plenty	433	9	$\frac{15}{32}$	3 00	42	6720
Plight	434	10	$\frac{7}{16}$	3 00	36	5720
Plod	435	11	$\frac{3}{8}$	2 45	29	4640
Plodder	436	12	$\frac{5}{16}$	1 90	21	3360
Plodding	437	13	$\frac{9}{32}$	1 50	16	2560
Plot	438	14	$\frac{17}{64}$	1 15	12	1920
Plotted	439	15	$\frac{1}{4}$	1 00	10	1600
Plough	440	16	$\frac{7}{32}$	90	8	1280
Plover	441	17	$\frac{3}{16}$	70	6	960
Plow	442	18	$\frac{11}{64}$	52	$4\frac{3}{10}$	688
Plowing	443	19	$\frac{9}{64}$	43	$3\frac{3}{10}$	528
Plowed	444	20	$\frac{1}{8}$	33	$2\frac{4}{10}$	384
Pluck	445	21	$\frac{3}{32}$	30	2	320

## WEATHERPROOF IRON LINE WIRE.

FOR FIRE ALARM, TELEPHONE, TELEGRAPH AND BURGLAR ALARM CONSTRUCTION.

DOUBLE BRAIDED.

Trade Word.	List No.	Gauge.	EXTRA B. B. WIRE.	
			Approximate Weight per mile.	Price per mile.
Plum	446	No. 8	500 pounds.	\$50 00
Plume	447	9	428 "	48 00
Plummet	448	10	378 "	45 00
Plump	449	11	320 "	42 00
Plunder	450	12	269 "	40 00
Plunge	451	14	180 "	38 00
Plunging	452	16	118 "	35 00

Put up in half mile coils.

Triple Braided Iron Wire of same quality furnished to order.



## GUY WIRE.

Shipped in bundles of from 60 to 100 pounds each.

No.	Trade Word.	List No.	Ex. BB.	Trade Word.	List No.	BB.	Trade Word.	List No.	Steel.
4	Plunket	3544	4 $\frac{1}{8}$	Poem	3555	3 $\frac{1}{8}$	Polder	3566	3
6	Plural	3545	4 $\frac{1}{8}$	Poet	3556	3 $\frac{1}{8}$	Polecat	3567	3
8	Pluarality	3546	4 $\frac{3}{8}$	Poetry	3557	3 $\frac{3}{8}$	Polemic	3568	3 $\frac{1}{8}$
9	Plush	3547	4 $\frac{1}{2}$	Poise	3558	3 $\frac{1}{2}$	Police	3569	3 $\frac{3}{8}$
10	Pluto	3548	4 $\frac{5}{8}$	Poised	3559	3 $\frac{5}{8}$	Policy	3570	3 $\frac{1}{2}$
11	Plutonic	3549	4 $\frac{5}{8}$	Poison	3560	3 $\frac{3}{4}$	Polish	3571	3 $\frac{5}{8}$
12	Pluvius	3550	4 $\frac{7}{8}$	Poisoned	3561	3 $\frac{3}{4}$	Politic	3572	3 $\frac{5}{8}$
13	Pneumatic	3551	5 $\frac{3}{8}$	Poke	3562	4	Polka	3573	3 $\frac{3}{4}$
14	Poach	3552	5 $\frac{3}{8}$	Poker	3563	4	Pollack	3574	3 $\frac{3}{4}$
15	Pock	3553	6	Poking	3564	5	Pollard	3575	4 $\frac{1}{2}$
16	Pocket	3554	7	Polar	3565	6	Pollen	3576	5 $\frac{1}{4}$

## ARC LIGHT ROPE.

Our rope is unquestionably the highest grade rope manufactured. Its advantages are obvious, being cheaper, lighter, more durable, very flexible and easy to handle. Is a great improvement over manilla rope or cord, as there is no stretching and shrinking with the changes of the weather.

Diam.	Trade Word.	List No.	Plain, per Ft.	Trade Word.	List No.	Galv. and Tinn'd per Ft.	Trade Word.	List No.	Copper per Ft.
$\frac{1}{4}$	Poller	3577	3 $\frac{1}{2}$	Ponderous	3582	4 $\frac{1}{2}$	Pontoon	3587	10
$\frac{7}{32}$	Pompous	3578	2 $\frac{3}{4}$	Ponent	3583	3 $\frac{1}{2}$	Poodle	3588	8
$\frac{3}{16}$	Pond	3579	2	Pongo	3584	2 $\frac{3}{4}$	Poplar	3589	5 $\frac{1}{2}$
$\frac{1}{8}$	Ponder	3580	1 $\frac{1}{2}$	Ponk	3585	2	Poppy	3590	4
$\frac{1}{16}$	Pondering	3581	1	Pontiff	3586	1 $\frac{1}{2}$	Popular	3591	2 $\frac{1}{2}$



## SPRING BRASS WIRE.

### FOR ARMATURE WIRE.

Trade Word.	List No.	Gauge No.		Price.
Populate	574	18 B. & S.	-----per pound	\$0 25
Populated	575	20 "	-----" "	26
Populous	576	22 "	-----" "	28
Porcate	577	24 "	-----" "	32

## BRUSH COPPER.

Trade Word.	List No.	B. & S.	¼-½ in.	½-1 in.	1-1½ in.	1½-2 in.	2-2½ in.	Over 2½.
Porcupine	749	23	\$0 37½	\$0 37	\$0 36½	\$0 36½	\$0 36½	\$0 36
Porite	750	24	37½	37	36½	36½	36½	36
Porous	751	25	38½	38	37½	37½	37½	37
Porpoise	752	26	38½	38	37½	37½	37½	37
Porret	753	27	40	39½	39	39	39	38
Port	754	28	40	39½	39	39	39	38
Portal	755	29	41	40½	40	40	40	39
Portico	756	30	41	40½	40	40	40	39
Portion	757	31	43	42	41½	41½	41½	40
Portrait	758	32	43½	42½	41½	41½	41½	40
Portlast	759	33	44½	43½	42½	42½	42½	41
Portoise	760	34	44½	43½	42½	42½	42½	41
Portray	761	35	46	45	44	44	44	42
Prose	762	36	47	46	45	45	45	43
Poser	763	37	50	49	46	45½	45	43
Possum	764	38	53	49½	48	47½	47	44
Postage	765	39	56	51	49½	48	47	44
Posterior	766	40	60	53	50	49	48	45

The stock is guaranteed to be pure copper, and free from burr.

## COMMUTATOR CONSERVER.

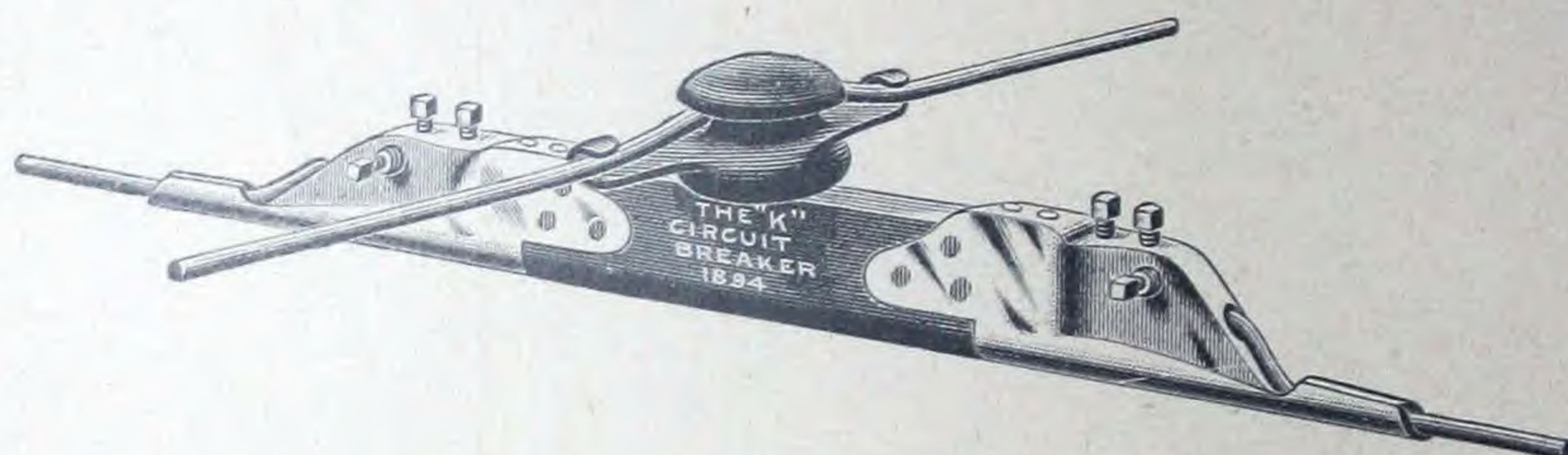
### FOR PREVENTING SPARKING OF DYNAMOS OR MOTORS.

Trade Word.	List No.		Price.
Postern	767	Per stick -----	\$1 25



## OVERHEAD MATERIAL.

### KNOX CIRCUIT BREAKER.

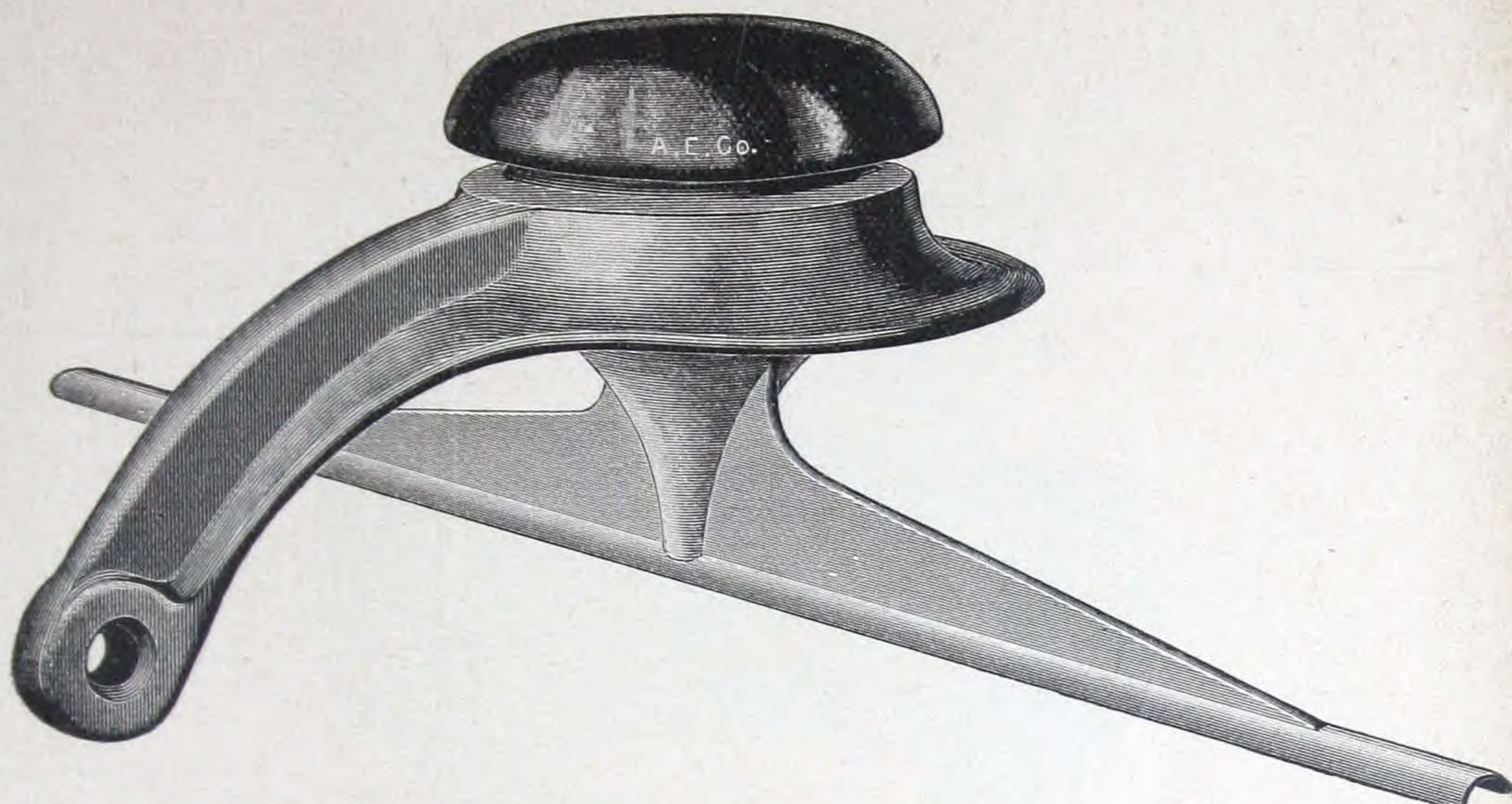


Strength, durability and ease in applying is claimed for the Knox trolley line circuit breaker. The wearing parts of this breaker, which is shown in the accompanying illustration, are so constructed as to enable us to offer it as a most durable trolley line circuit breaker. It has a tensile strength of more than double that of the trolley wire, and can be placed in the line in less than 15 minutes. It is indestructible, and offers the highest possible resistance to the leakage of current across its insulating parts. It does not get out of order, and affords the easy passage of trolley wheel over the parts, which is lacking in other forms of circuit breakers. The set screws on the sides of the brasses are for a fuse, should it be desirable to fuse from one section of line to another.

Trade Word.	List No.	Price.
Postfix	3035	each \$9 00



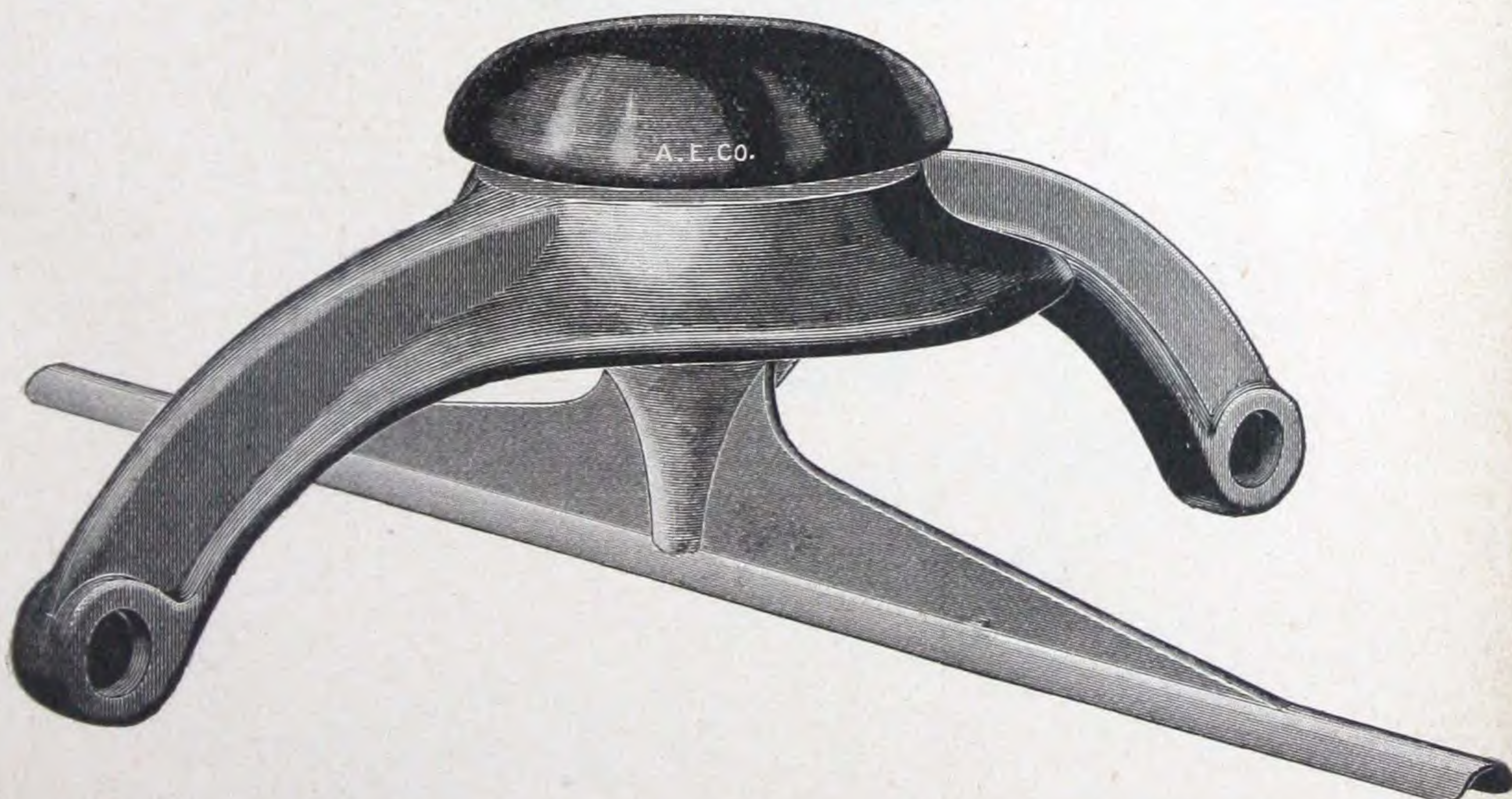
## SINGLE PULL-OVER.



Made for Nos. 0, 2 B. & S. and 4 B. G. W. wire.

Trade Word.	List No.		Price.
Postique	3000	With 15-inch light ear .....	each \$1 65
Posture	3001	" 15 " heavy " .....	each 1 80

## DOUBLE PULL-OVER.

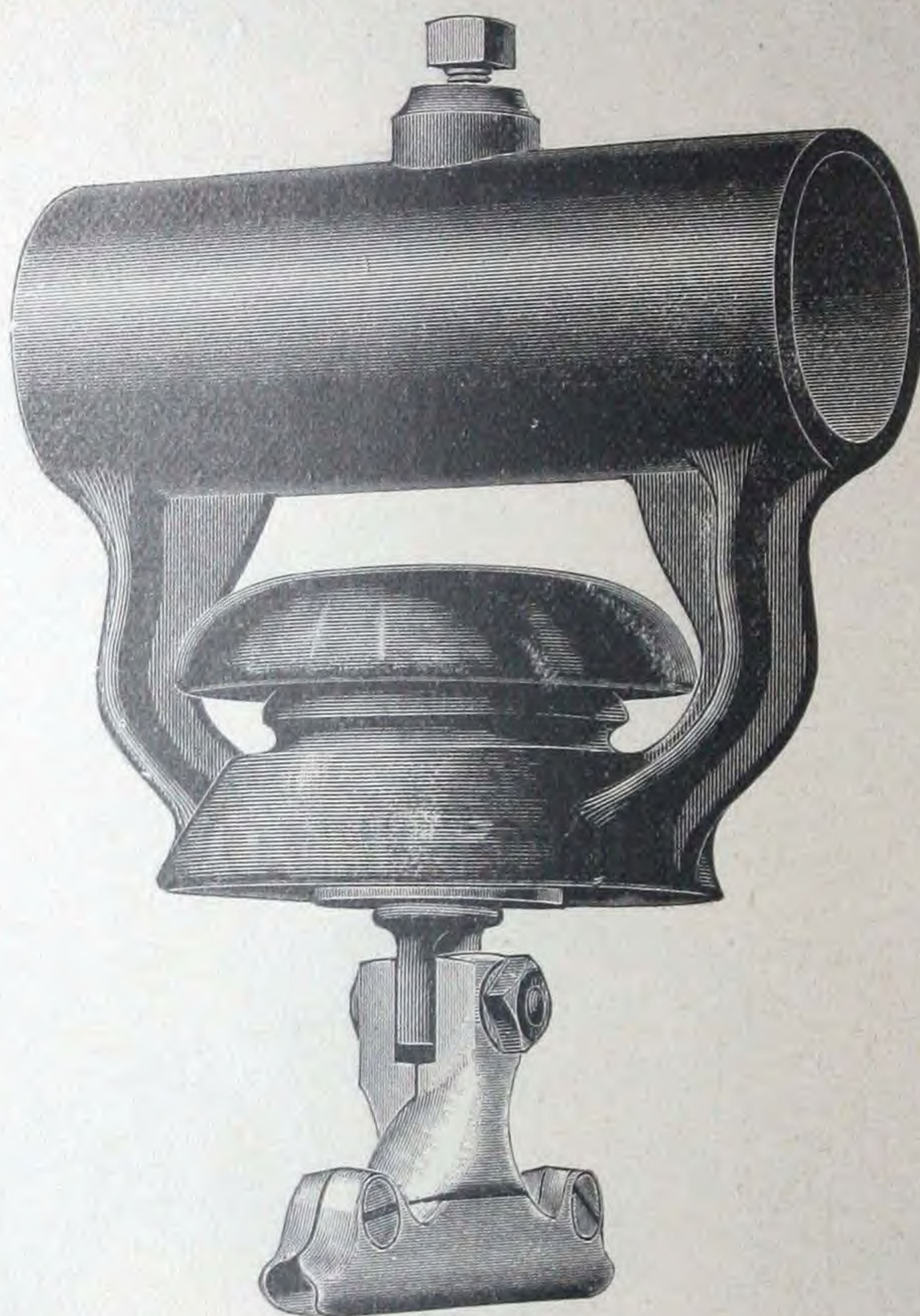


Made for Nos. 0, 2 B. & S. and 4 B. W. G. wire.

Trade Word.	List No.		Price.
Potager	3002	With 15-inch light ear .....	each \$1 75
Potassa	3003	" 15 " heavy " .....	each 1 90



## PIPE BRACKET HANGER.



This hanger is made to fit a standard pipe bracket arm, and can be adjusted to pipe by means of a set screw.

Trade Word.	List No.			Price.
Potassium	3004	1 $\frac{1}{4}$ inch pipe	.....each	\$1 60
Potato	3005	1 $\frac{1}{2}$ " "	....."	1 70



# BRIDGE AND BARN INSULATOR.

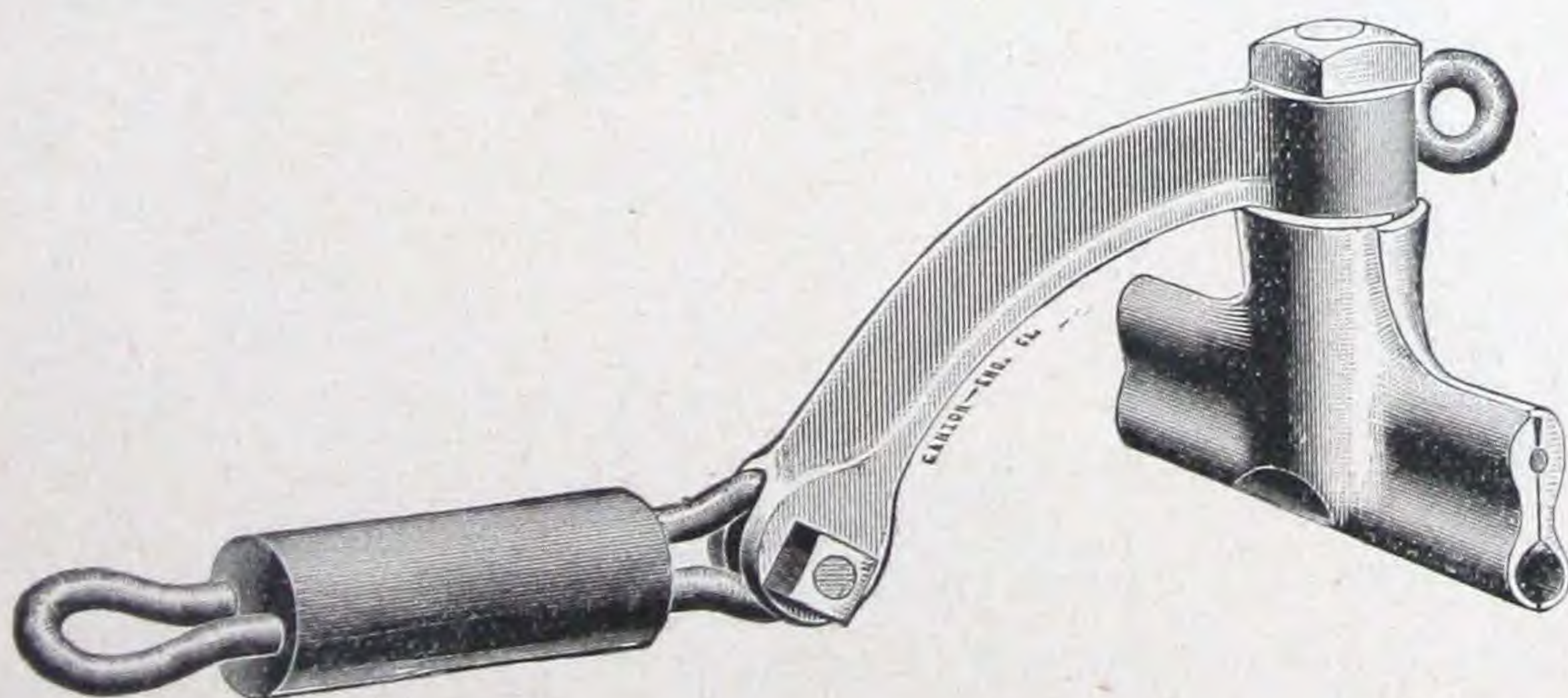


This Insulator can be used in car barns, mines, tunnels and for bridge work; also under elevated railway structures.

Made for Nos. 0, 2 B. & S. and 4 B. W. G. trolley wire.

Trade Word.	List No.	Price.
Potentate	3006	each \$1 60

# SINGLE AND DOUBLE PULL-OVER.

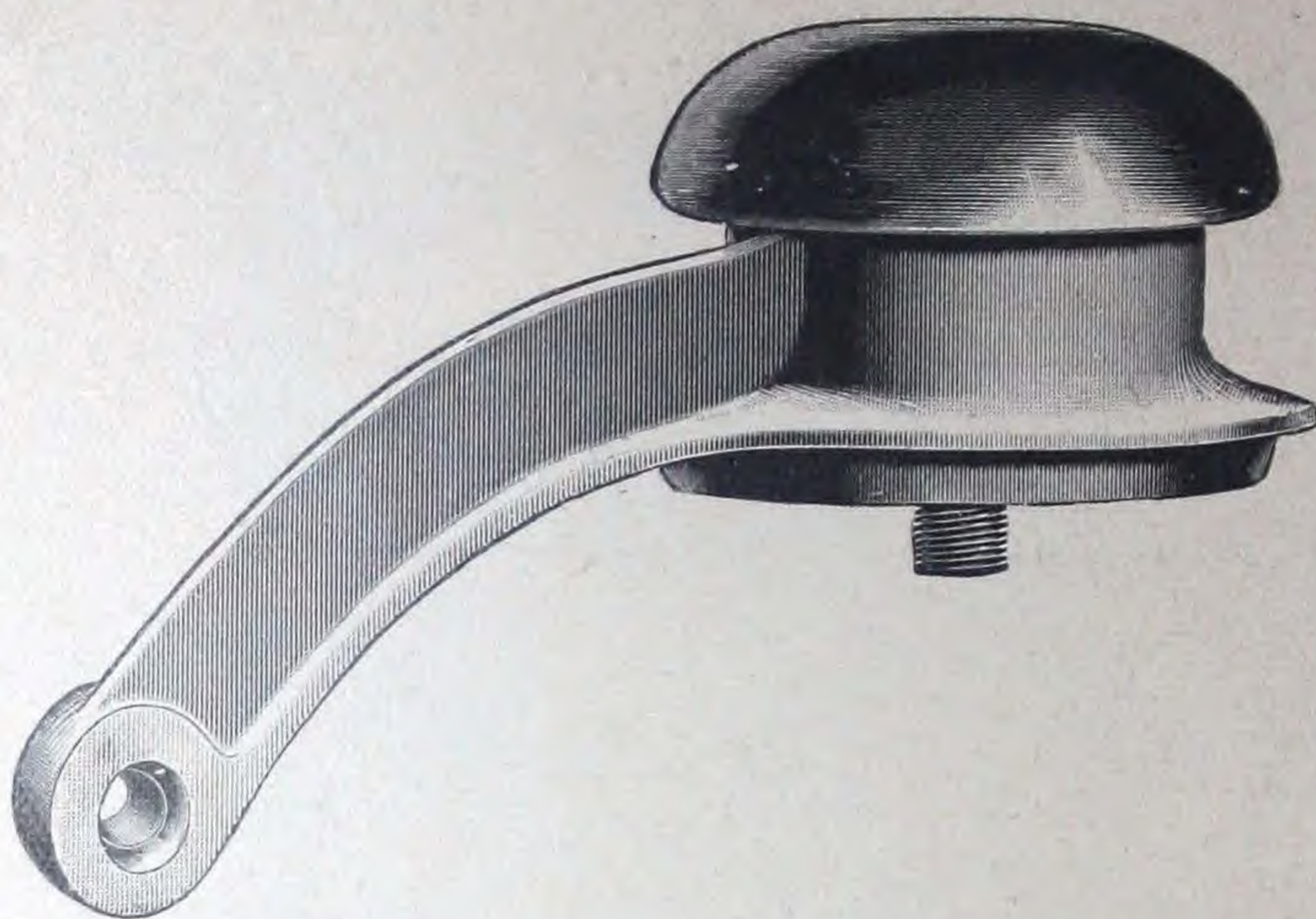


When ordering, state size of trolley wire in use.

Trade Word.	List No.	Price.
Pothecary	3007	Complete each \$1 50

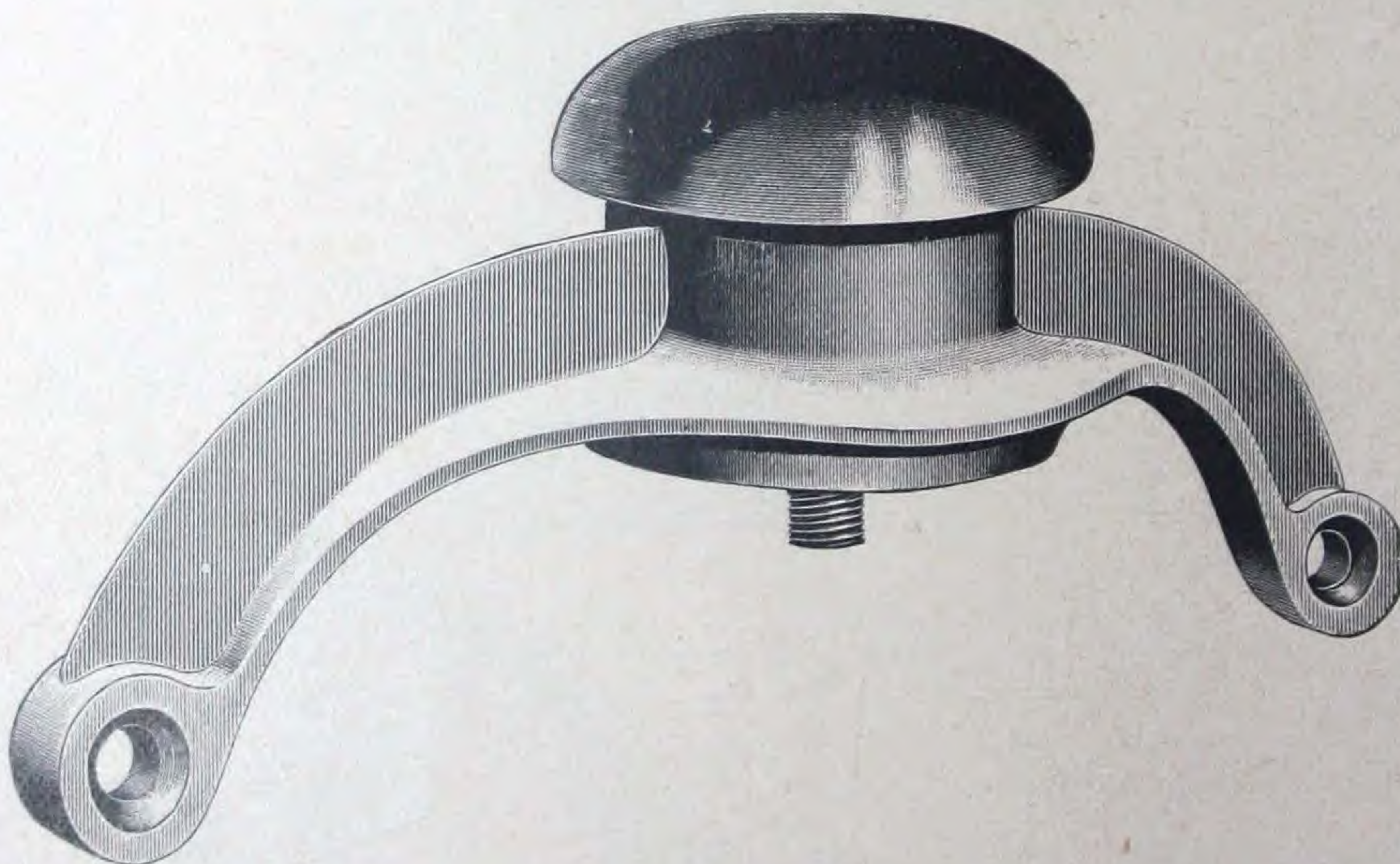


## PULL-OVERS.



Trade Word.	List No.			Price.
Pouch	3008	Without clamp	each	\$1 00
Poultry	3009	With clamp	"	1 60
Precept	3010	" heavy, soldered ear	"	1 80

In ordering clamps or ears, always state size of trolley wire in use.

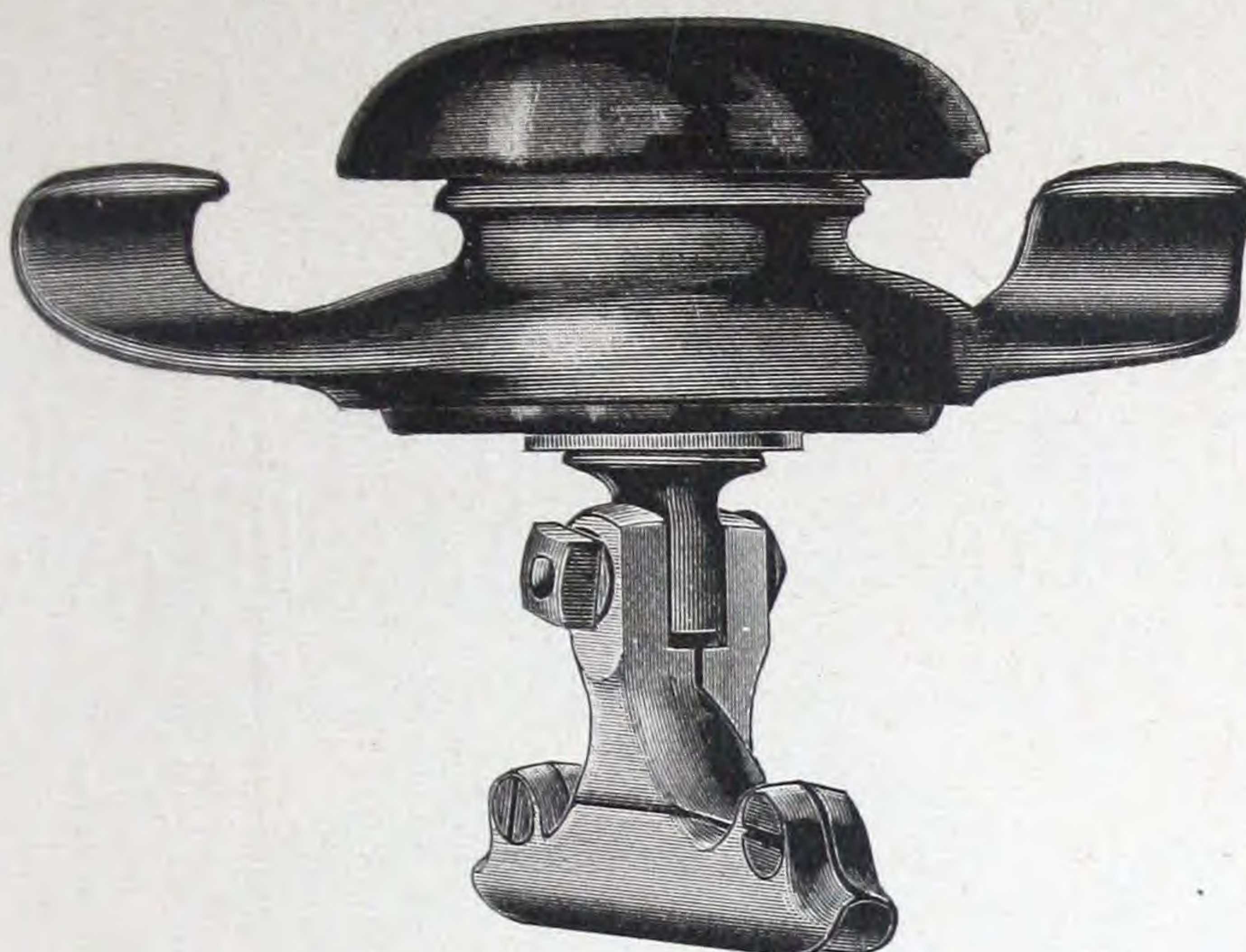


These Pull-Overs are similar in design to Nos. 3000 and 3002, but can be used with the Mansfield Clamp instead of soldered ears, if so desired.

Trade Word.	List No.			Price.
Preceptor	3011	Without clamp	each	\$1 10
Precession	3012	With clamp	"	1 70
Precinct	3013	" heavy, soldered ear	"	1 90



# STRAIGHT LINE HANGER.

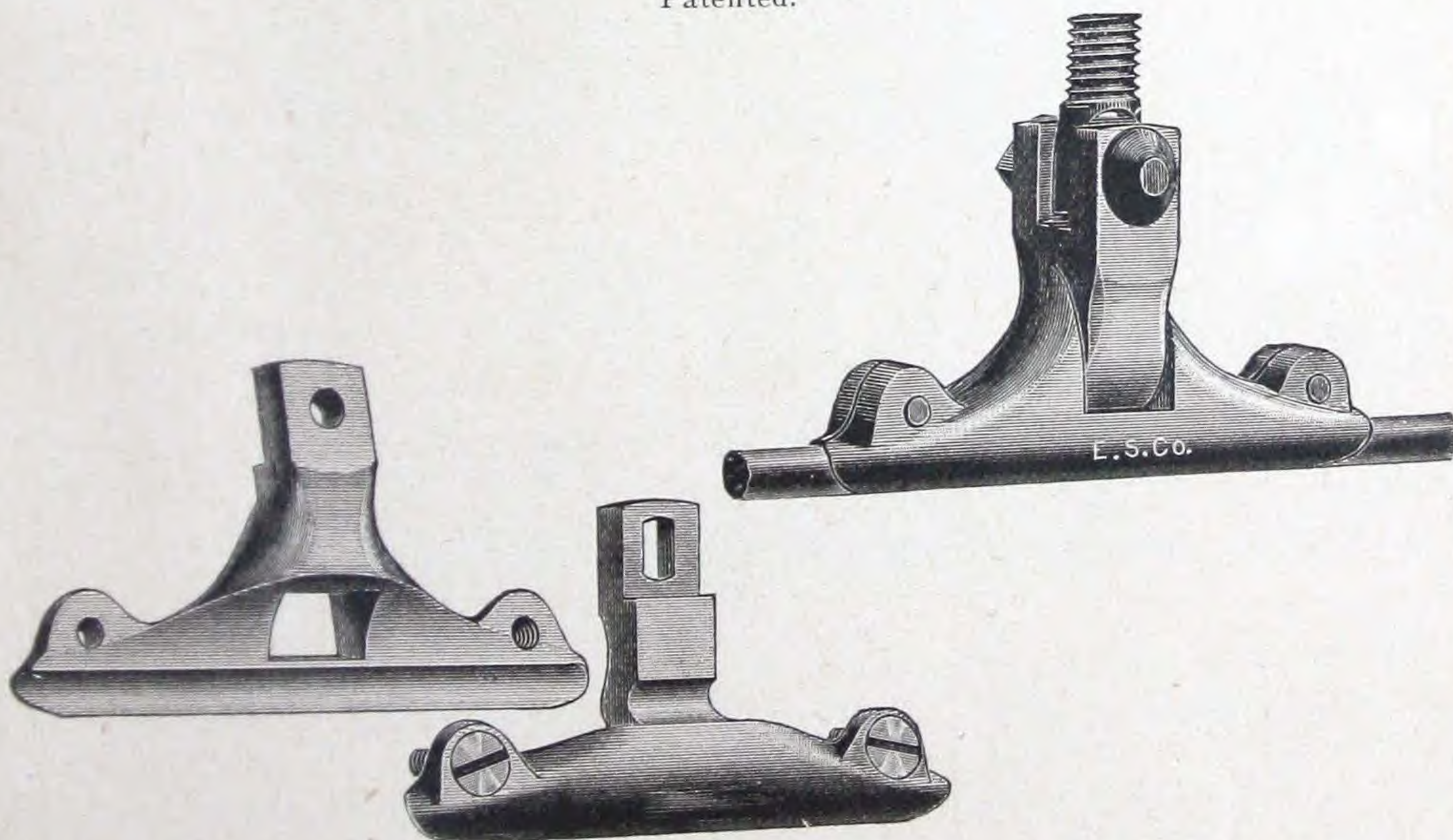


They will stand a strain of from 7000 to 8000 pounds.  
Made for Nos. 0, 2 B. & S. and 4 B. W. G. wire.

Trade Word.	List No.		Price.
Precious	3014	Complete .....	each \$1 50

# TROLLEY CLAMP.

Patented.

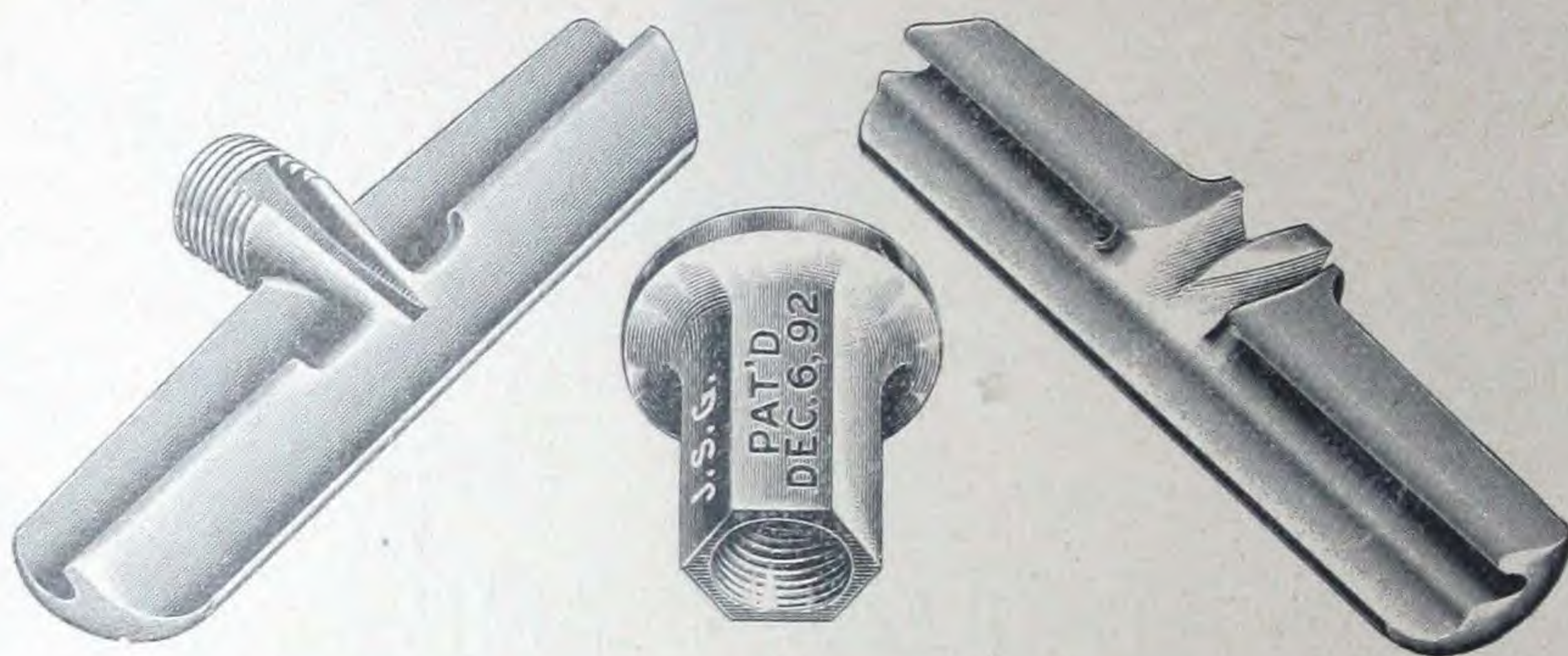


In ordering clamps always state size of trolley wire in use.  
Made for Nos. 0, 2 B. & S. and 4 B. W. G. wire.

Trade Word.	List No.		Price.
Precipice	3015	.....	each \$0 60



## HERCULES TROLLEY CLAMP.



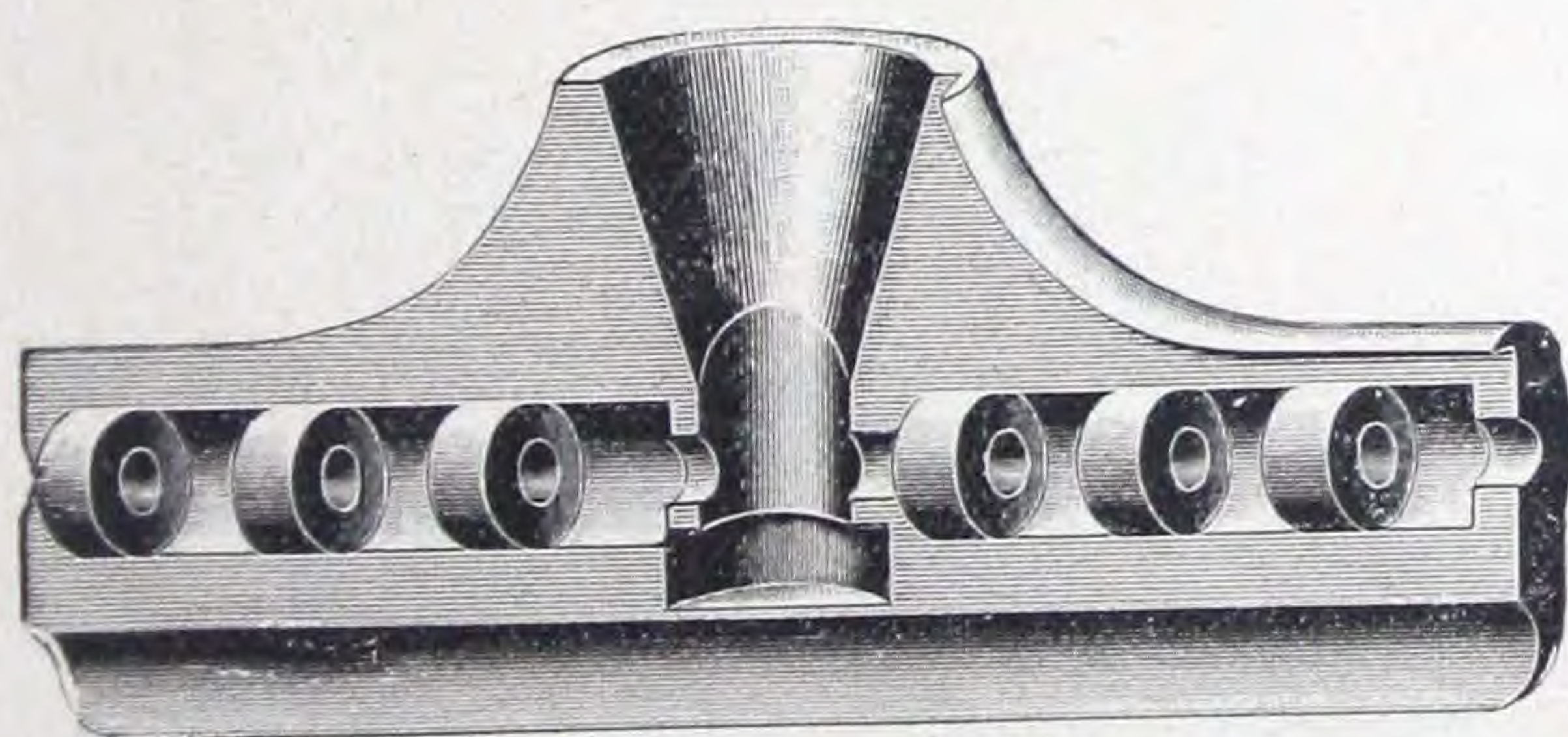
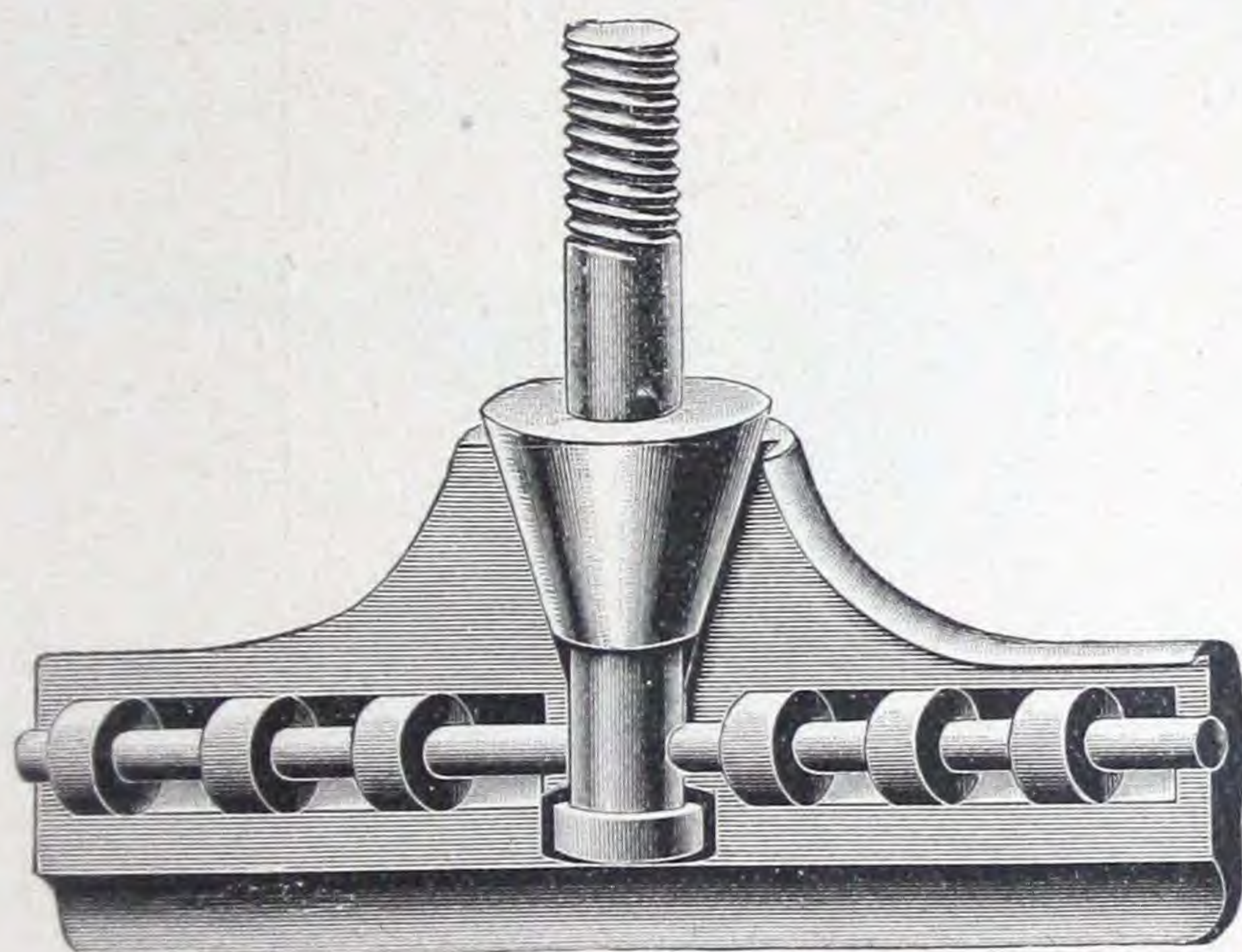
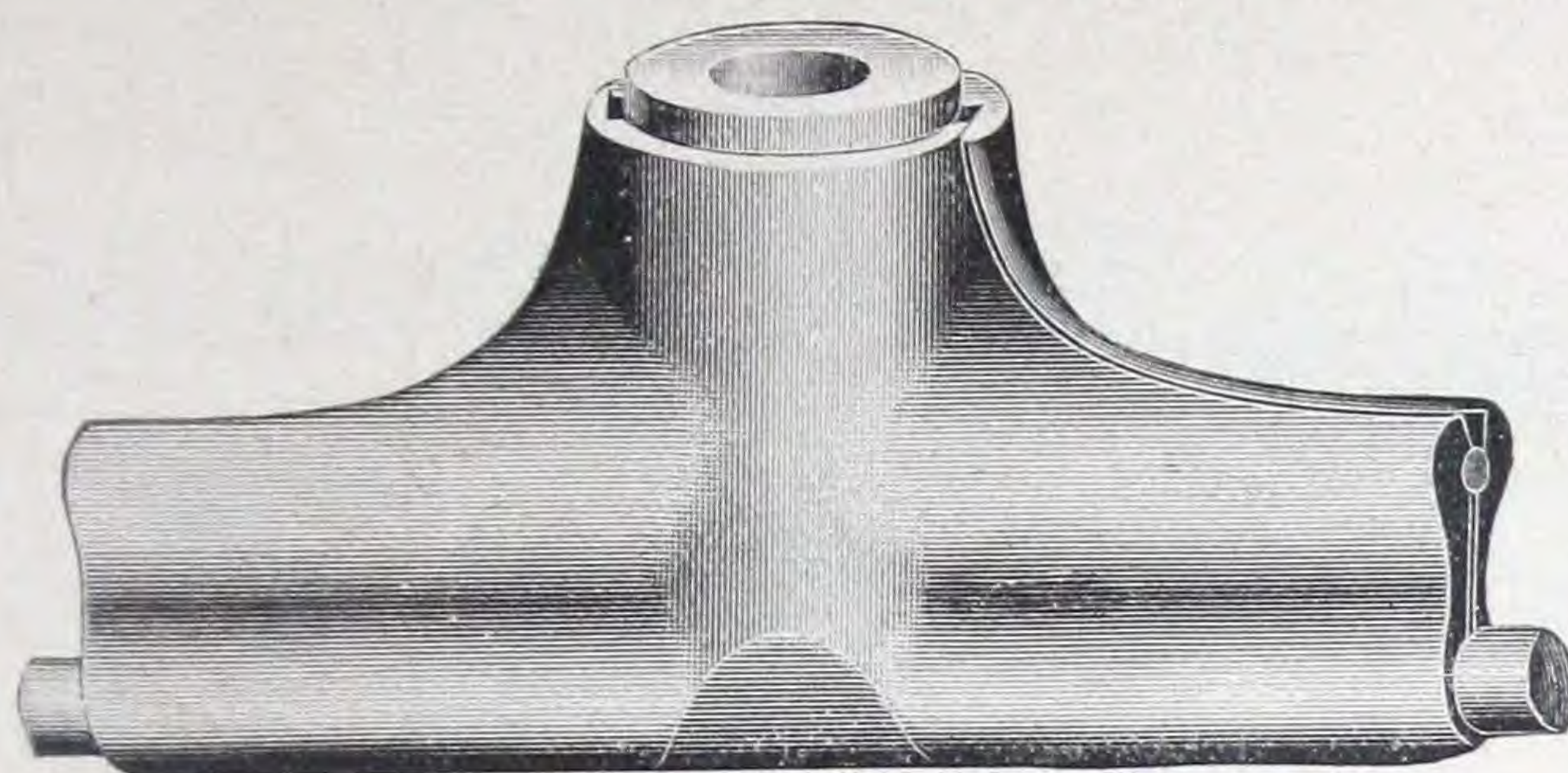
The Hercules trolley clamp is the only trolley clamp that has in an equal degree the particular merits of soldered ears, namely, their strong hold on the trolley wire and the smooth passage they afford the trolley wheel. These facts taken in connection with the further one, that it is the simplest trolley clamp made and therefore the cheapest to install, render the Hercules trolley clamp a perfect device for its purpose. The Hercules trolley clamp is made for three sizes of wire, namely, No. 0 and No. 1 B. & S. gauge and No. 2 Birmingham gauge and for any size stud from  $\frac{7}{16}$  inch to  $\frac{5}{8}$  inch inclusive.

Trade Word.	List No.	Price.
Precise	3017	each \$0 60

In ordering please give size of wire, also size of stud required.



## TROLLEY CLAMP.



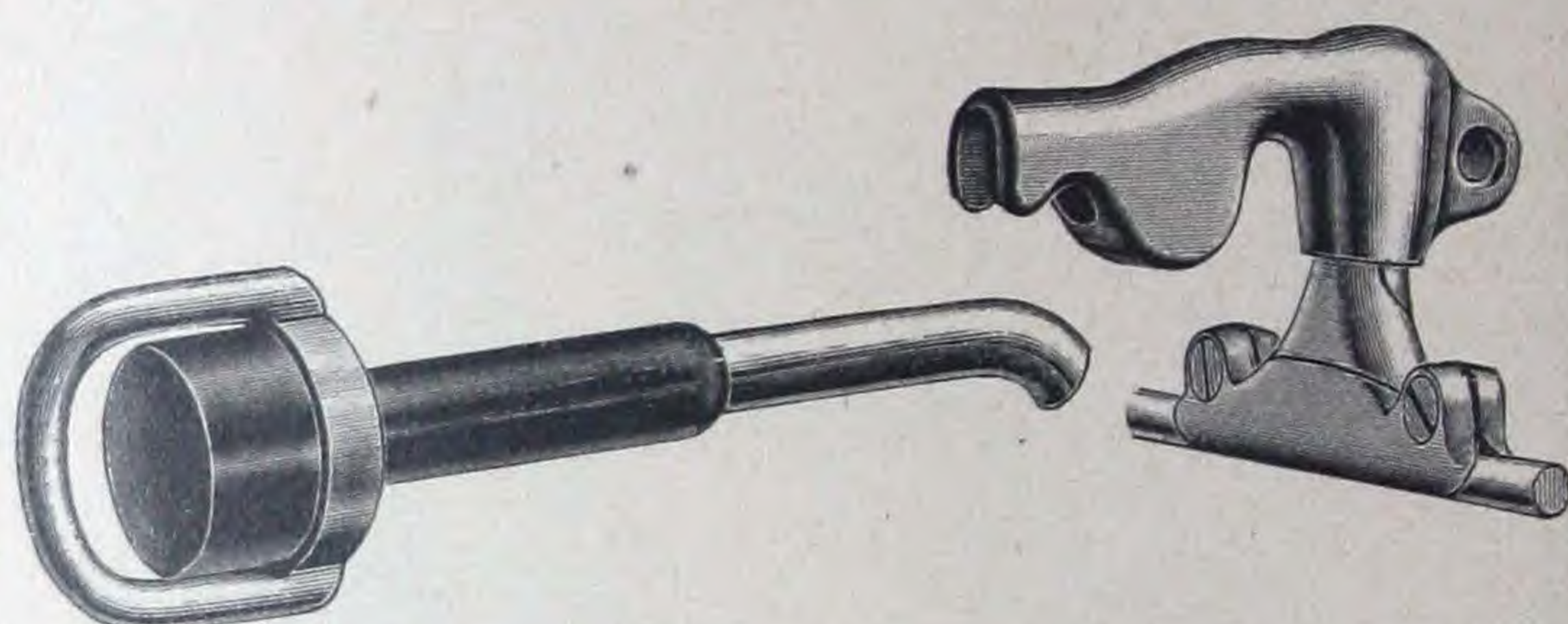
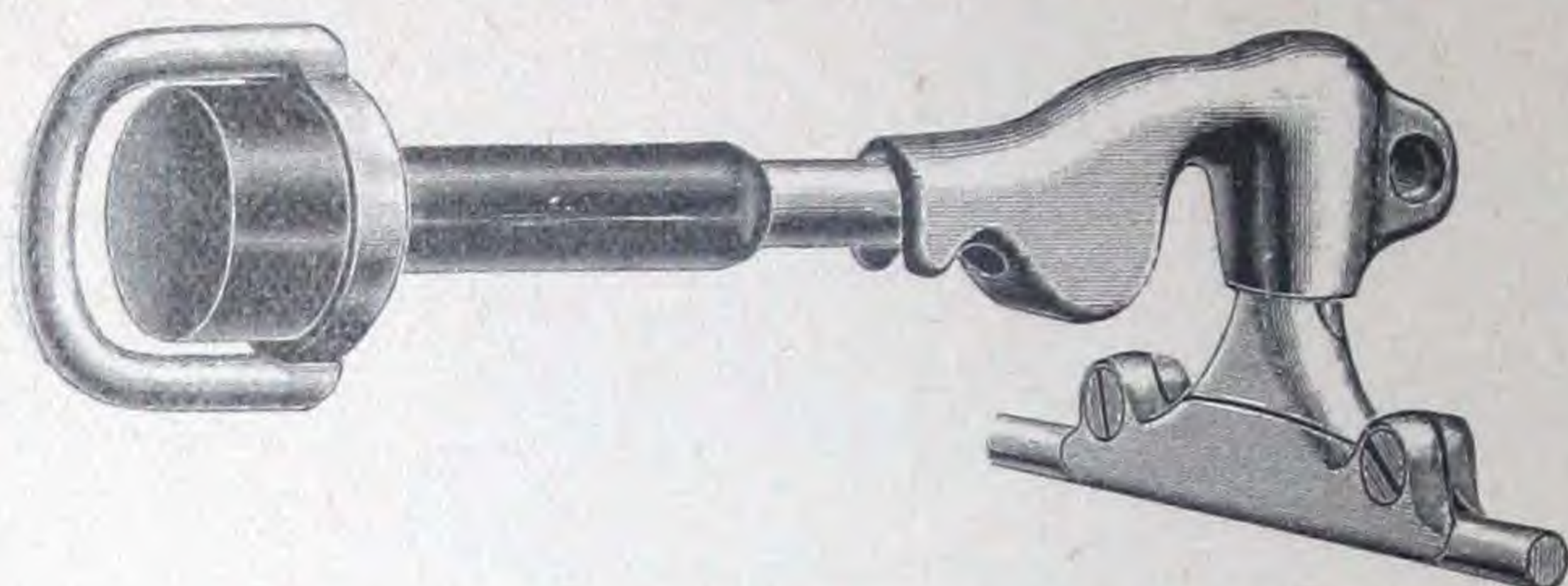
This clamp is designed for heavy traffic. It is made of bronze metal, hinged on an inter-locking pin, which passes through the head of a stud bolt. By the use of this clamp a firm grip on the trolley wire is insured, and sparking of trolley wheel is done away with. In ordering clamp, state size of trolley wire in use.

Trade Word.	List No.	Price.
Precisive	3016	.....each \$0 70



# IMPROVED SINGLE AND DOUBLE PULL-OVER.

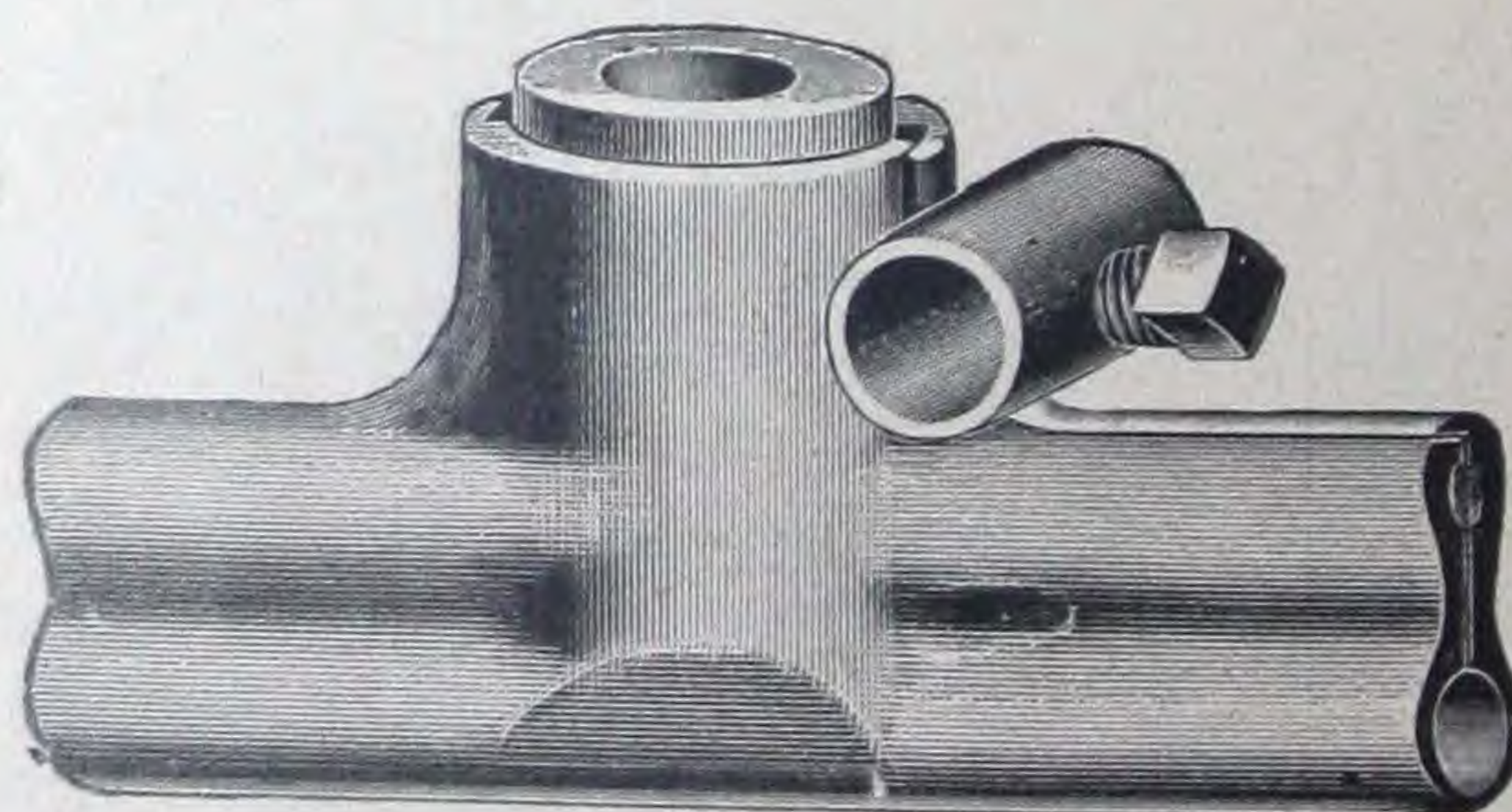
Patented.



Made for No. 0 B. & S. trolley wire only.

Trade Word.	List No.		Price.
Predial	3018	-----	each \$1 75
Predicate	3019	With extra long ear for heavy work -----	“ 2 25

## FEEDER CLAMP.

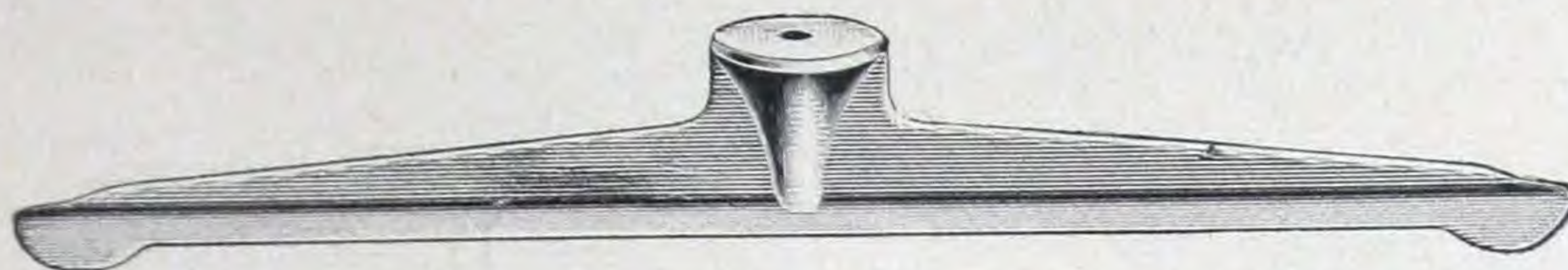


In ordering, state size of trolley wire in use.

Trade Word.	List No.		Price.
Predict	3020	-----	each \$1 00



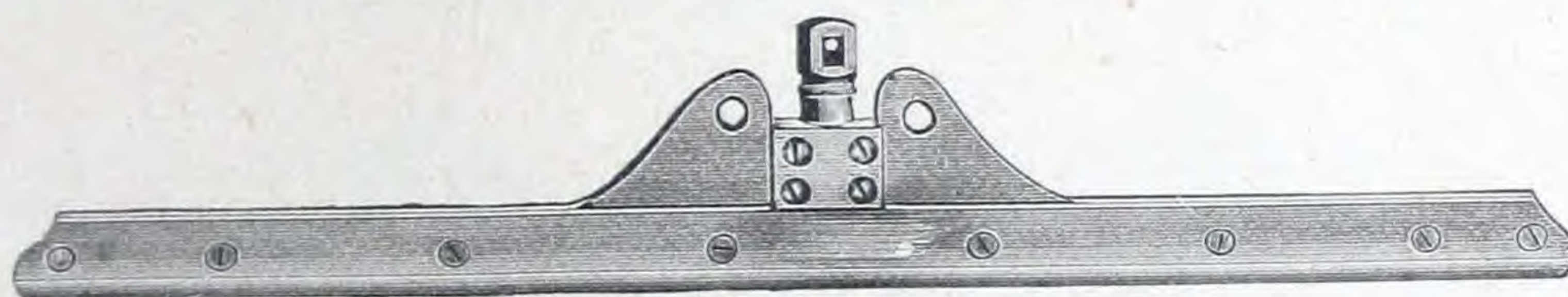
## SOLDERED TROLLEY WIRE EAR.



If ears are to be used on hangers, other than our own make, specify number of threads to the inch of hanger studs. In ordering ears state size of trolley wire in use.

Trade Word.	List No.			Price.
Prejudice	3021	9 inch	each	\$0 60
Prelate	3022	15 " light	"	65
Prelation	3023	15 " heavy	"	80

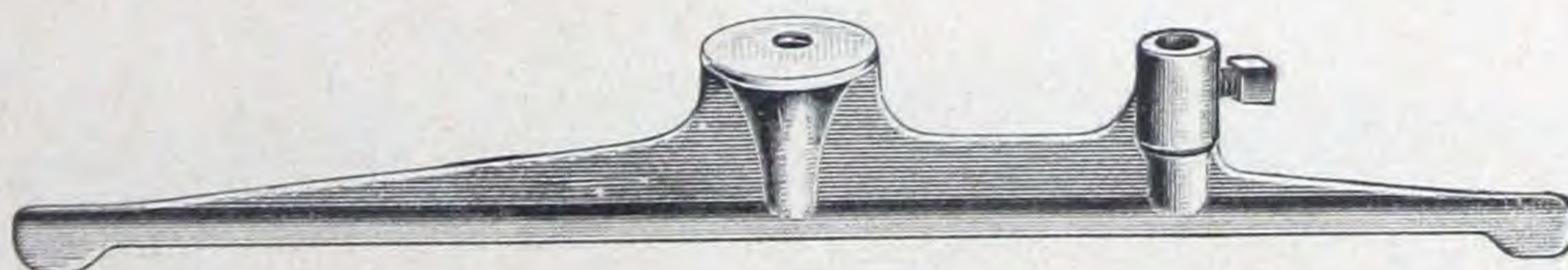
## SINGLE AND DOUBLE ANCHOR PLATE.



Trade Word.	List No.			Price.
Prelature	3024	Single ear	each	\$3 00
Prelaty	3025	Double "	"	3 50

In ordering anchor plates, state size of trolley wire in use.

## FEEDER EAR.



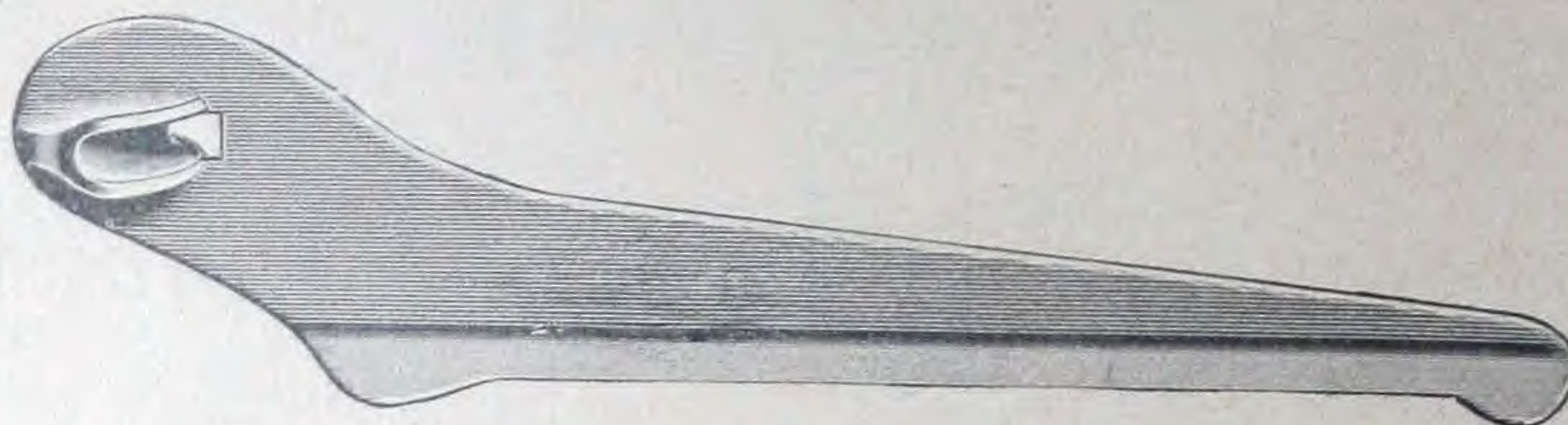
Trade Word.	List No.			Price.
Prenunciation	3026		each	\$1 00

In ordering ears, state size of trolley wire in use.



## ADJUSTABLE STRAIN EAR.

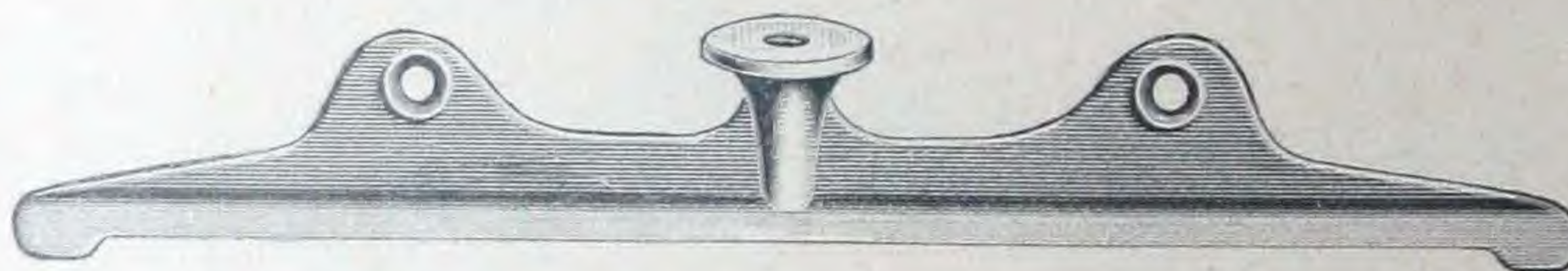
FOR SINGLE CURVES.



Trade Word.	List No.		Price.
Preordain	3027	----- each	\$1 00

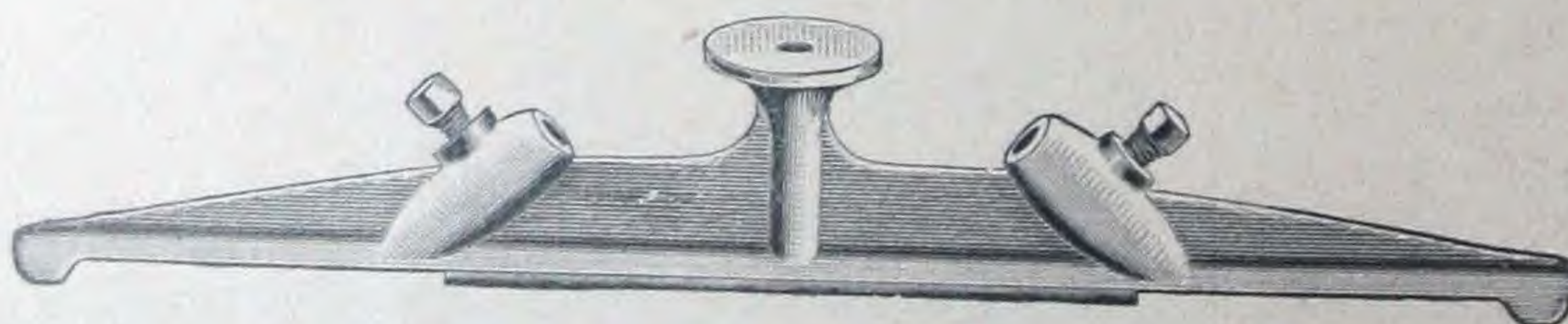
## STRAIN EAR.

FOR DOUBLE CURVES.



Trade Word.	List No.		Price.
Prepose	3028	----- each	\$1 25

## SPLICING EAR.

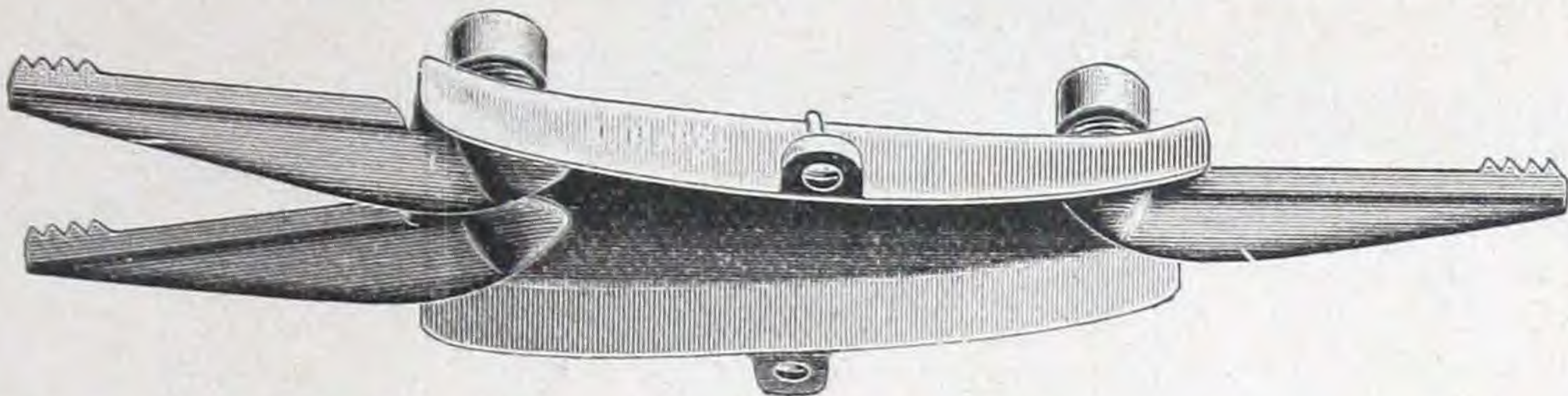


Trade Word.	List No.		Price.
Prescribe	3029	----- each	\$1 20

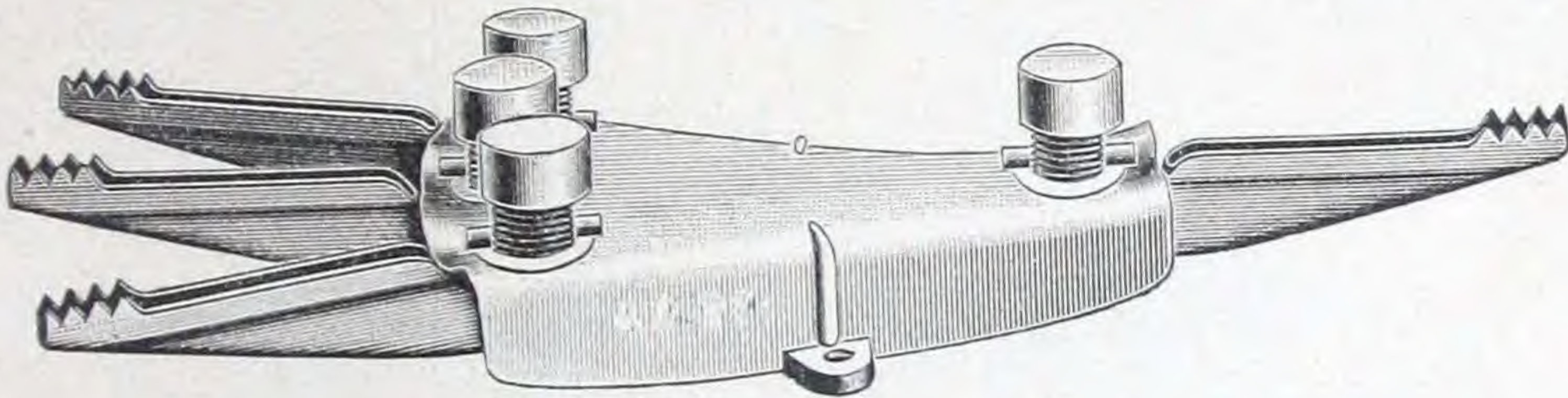
In ordering above ears, state size of trolley wire in use.



ADJUSTABLE SWITCHES.



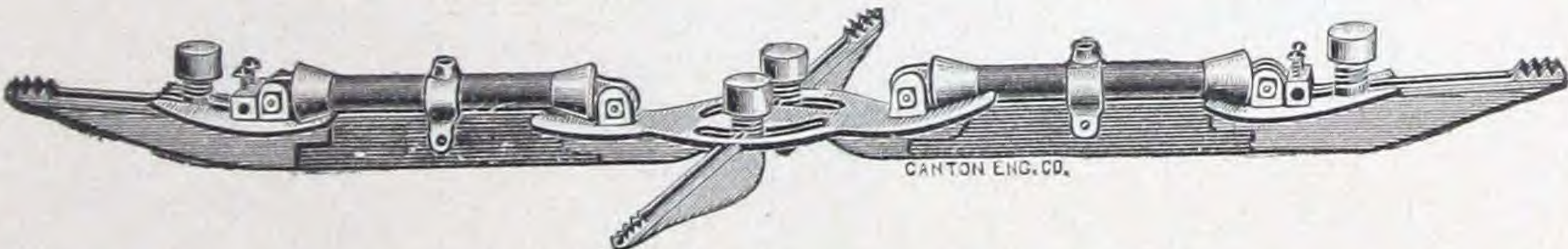
Trade Word.	List No.		Price.
Presented	3030	Two-way .....	each \$4 00



These switches are provided with adjustable tongues, hinged to the body and can be used either as right, left or diamond turn-outs.

Trade Word.	List No.		Price.
President	3031	Three-way .....	each \$5 50

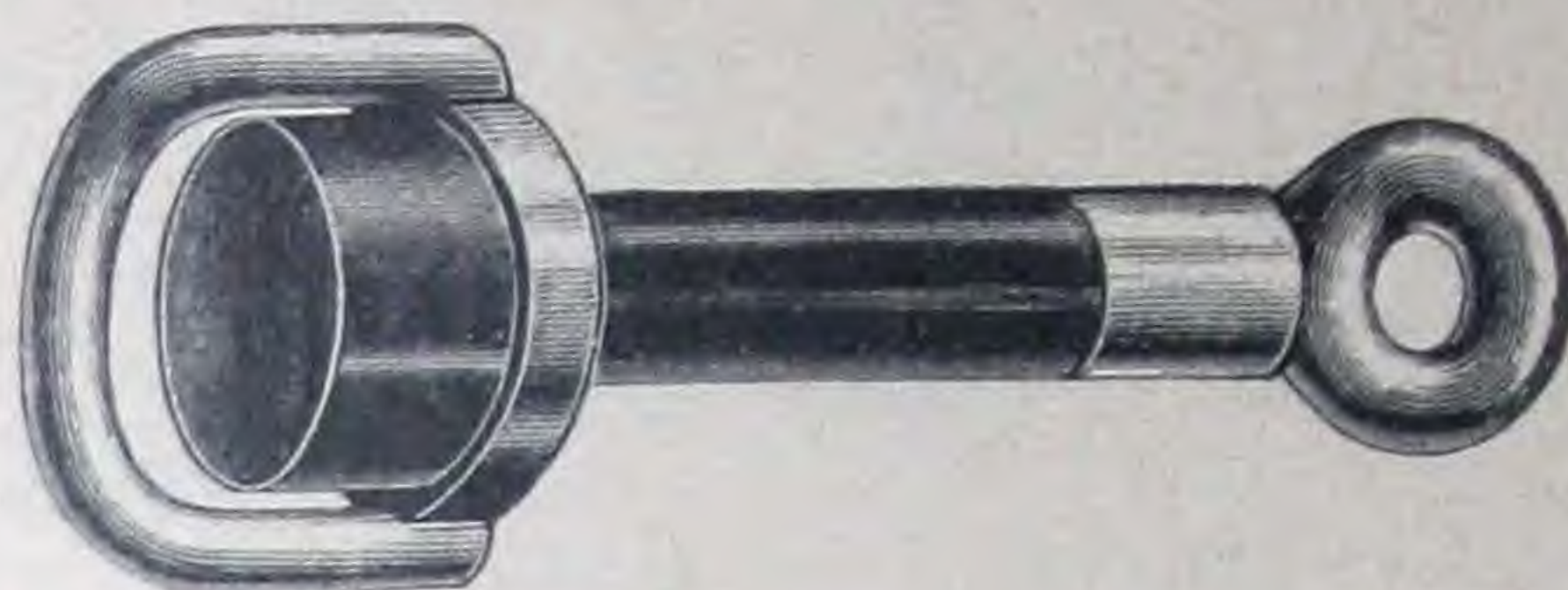
INSULATED ADJUSTABLE CROSS-OVER.



Trade Word.	List No.		Price.
Presidential	3032	.....	each \$20 00



## STRAIN INSULATOR.



Made of a high grade of hard rubber, with brass castings. Breaking strain, 3000 pounds.

Trade Word.	List No.		Price.
Prest	3036	----- each	\$0 70

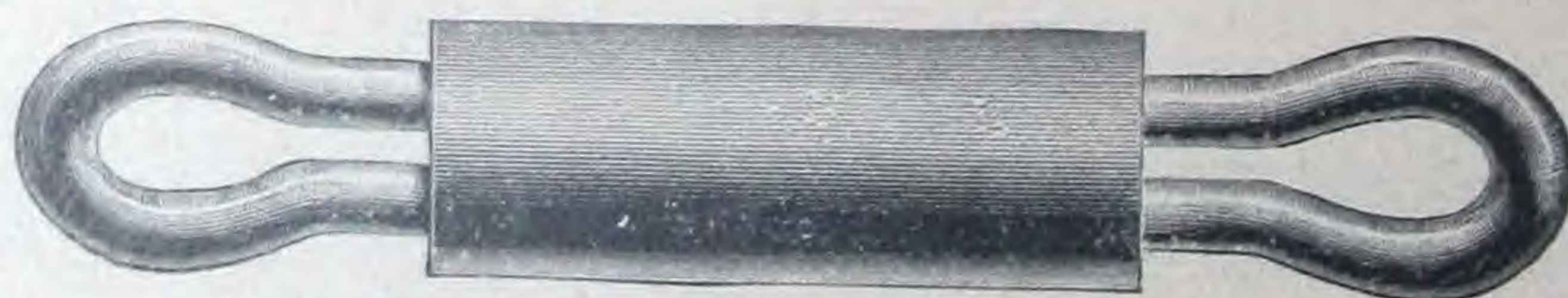
## WOODEN STRAIN INSULATOR.

FOR SPAN WIRE USE.



Trade Word.	List No.		Price.
Prester	3037	----- each	\$0 60

## STRAIN INSULATOR.



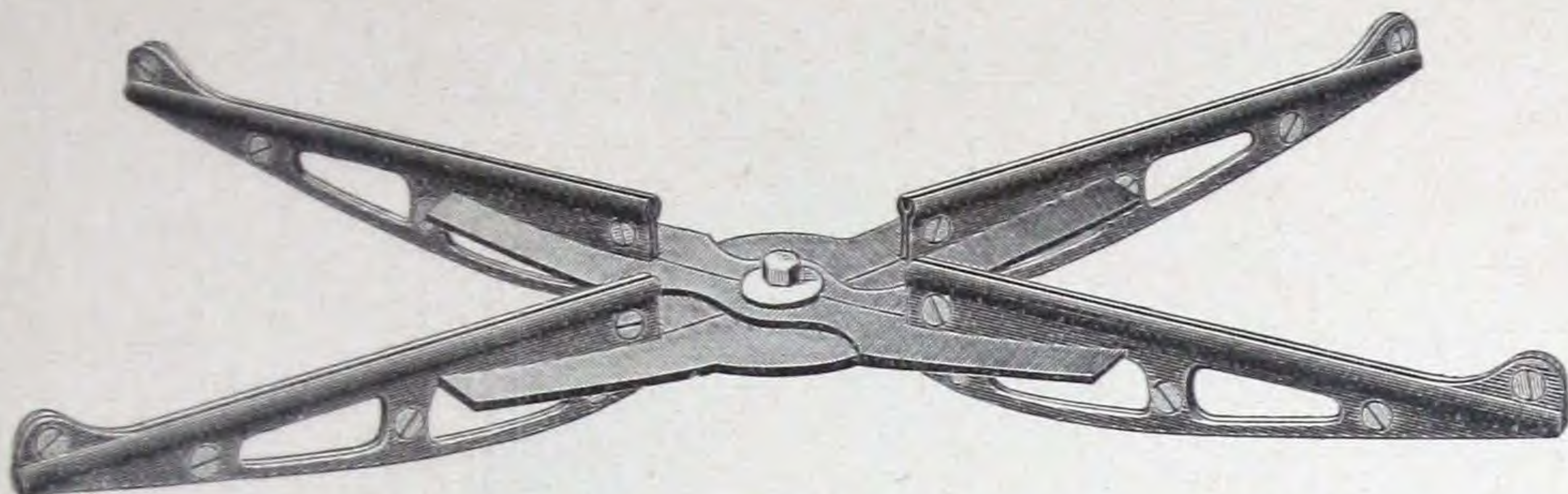
Made in two sizes. Medium strain insulator has a breaking strain of 5000 pounds. Large strain insulator has a breaking strain of 10000 pounds. This medium size insulator consists of two steel staples, 5 inches long,  $\frac{3}{8}$  inch diameter, moulded into a special compound. Size over all is 7 inches in length, and weighs about 12 ounces.

We guarantee this insulator to be a superior article.

Trade Word.	List No.		Price.
Prestige	3038	Medium size ----- each	\$0 75
Presto	3039	Large " ----- "	1 25

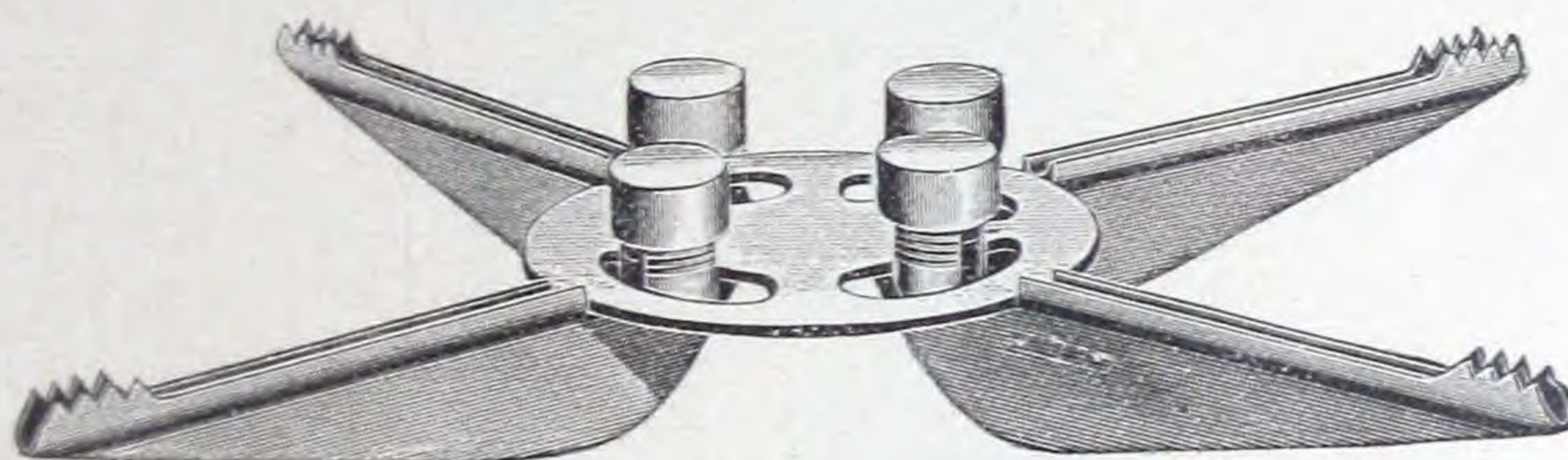


## ADJUSTABLE CROSS-OVERS.



This cross-over is made of brass, is strong and rigid, and can be adjusted to any desired angle.

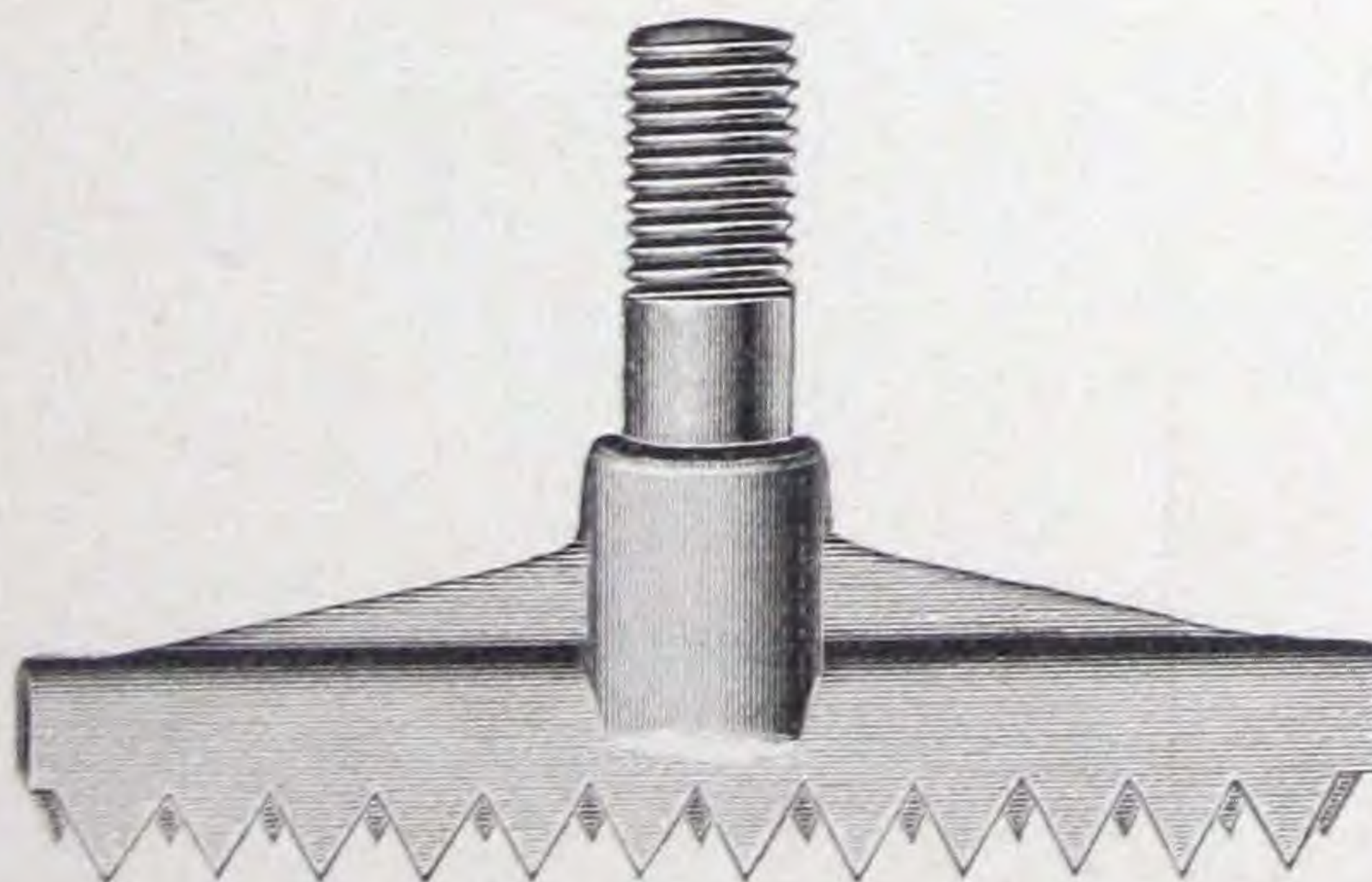
Trade Word.	List No.		Price.
Presume	3040	..... each	\$8 00



Fitted with adjustable tongues and improved clamping device, similar to those used with Wood's adjustable switches.

Trade Word.	List No.		Price.
Presuming	3041	..... each	\$7 50

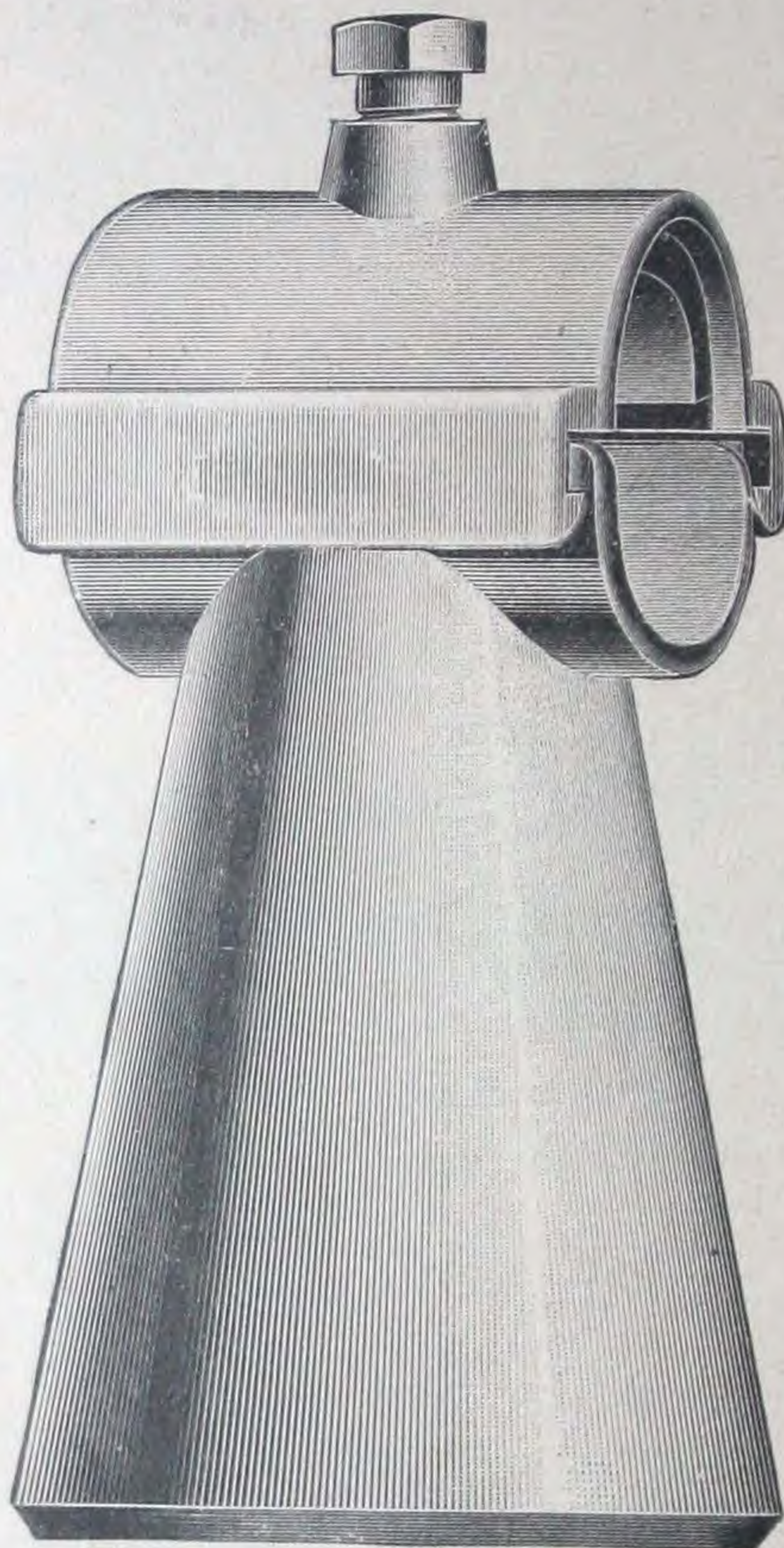
## FEEDER YOKE.



Trade Word.	List No.		Price.
Presumption	3042	..... each	\$0 70



## FEEDER WIRE INSULATOR.

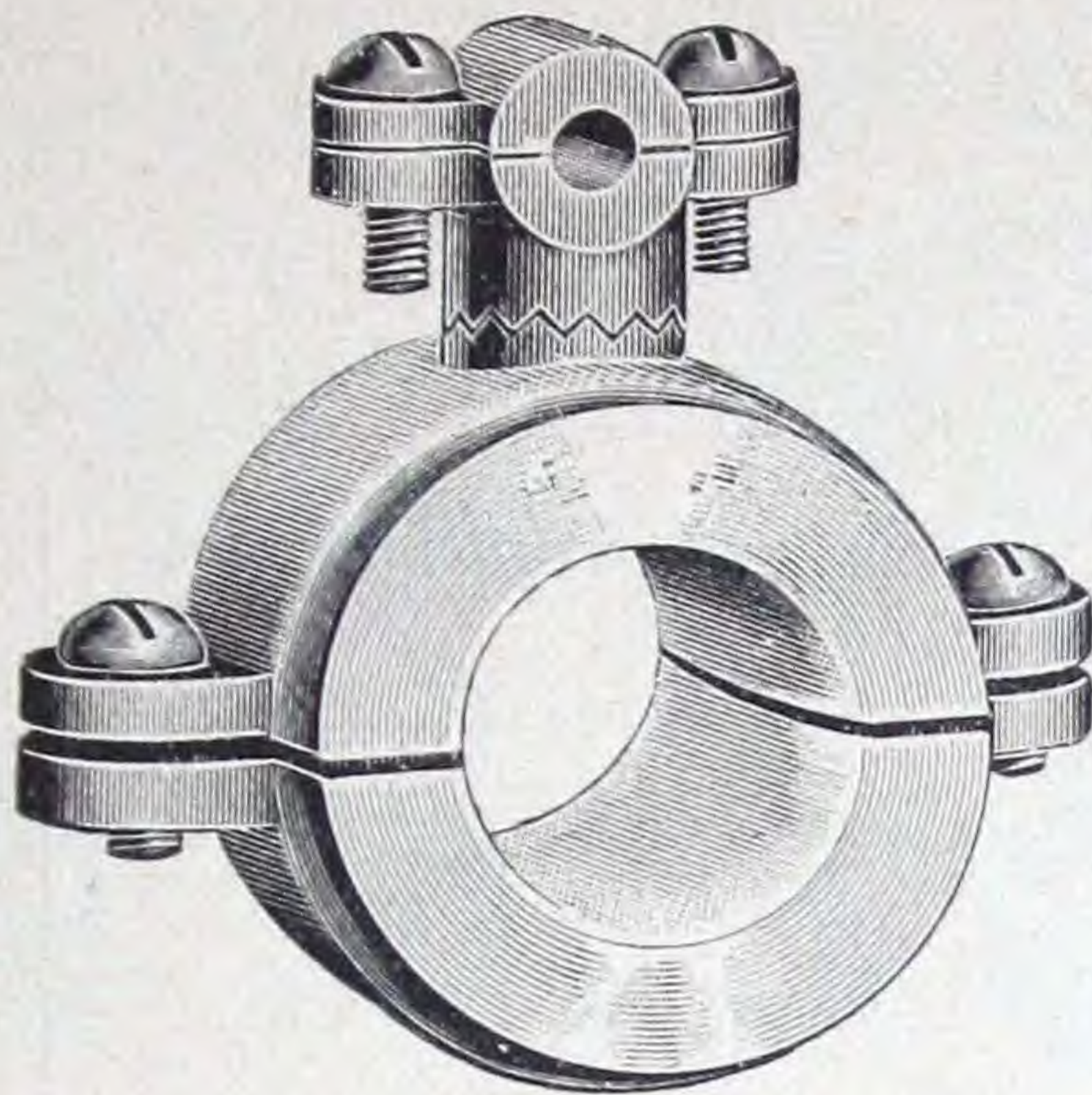


The shell of this insulator is made of malleable iron, in which is molded a high grade of insulation. It is made with a double petticoat, and threaded to fit on a standard pin. The feeder wire is fastened securely in position by a special clamping device which will not allow the wire to pull through. This insulator fills a long felt want, and we recommend it to all electric roads using a feeder larger than one inch in diameter.

Trade Word.	List No.		Price.
Pretence	3043	For $1\frac{1}{4}$ inch and smaller diameter of wire.....each	\$1 00
		Larger sizes made to order.	



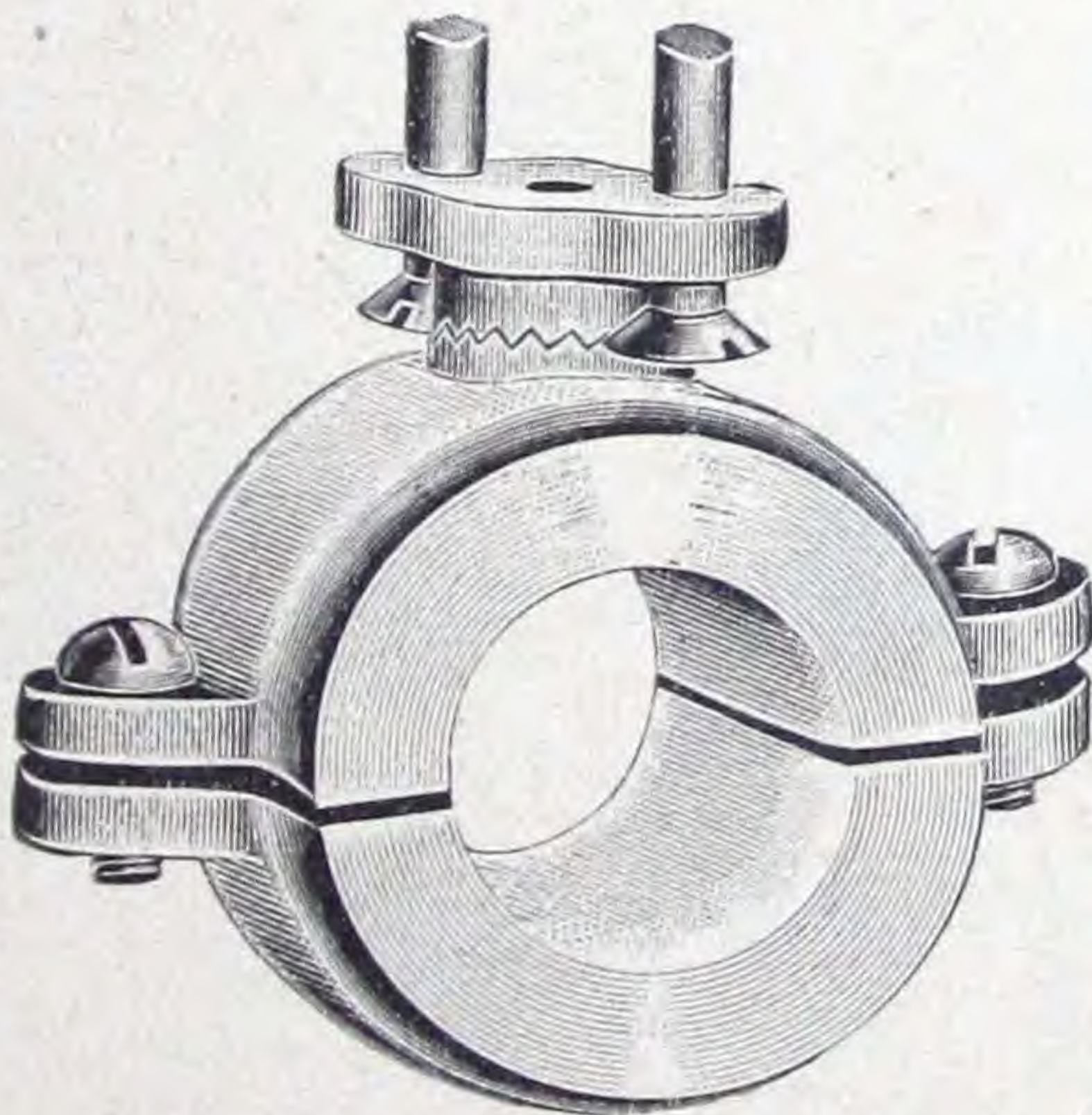
WIRE CARRIER.



This device is designed to carry heavy feeder wires. Suspension wire passes through clamping arrangement on top of carrier.

Trade Word.	List No.				Price.
Pretend	3044	1 inch opening	-----	each	\$0 60
Pretender	3045	1 1/4 " "	-----	"	70
Pretending	3046	1 1/2 " "	-----	"	90

WIRE HOLDER.

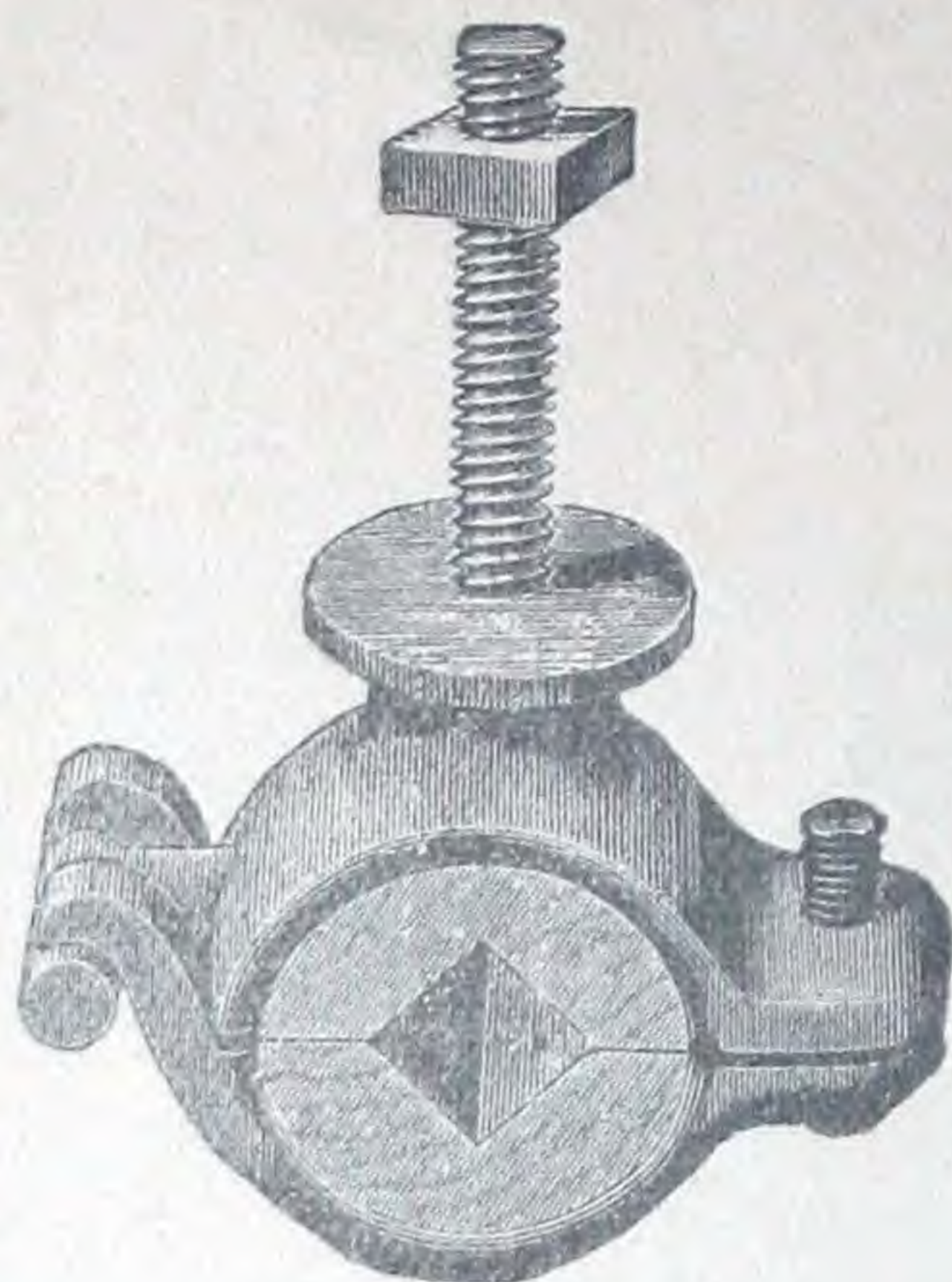


Similar to No. 3044, but is designed to be bolted or attached to trees, cross-arms, etc.

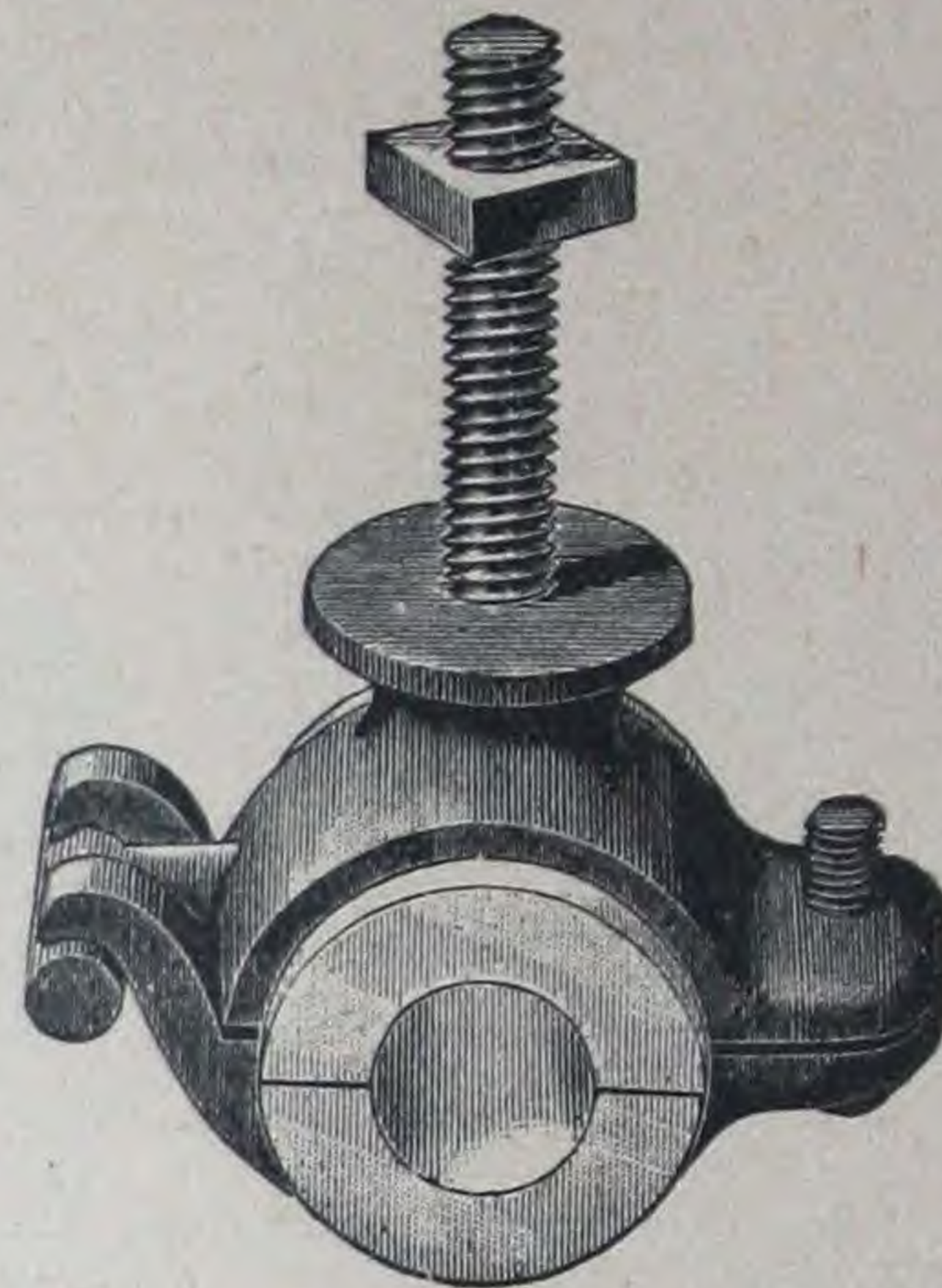
Trade Word.	List No.				Price.
Pretex	3047	1 inch opening	-----	each	\$0 60
Pretty	3048	1 1/4 " "	-----	"	70
Prevail	3049	1 1/2 " "	-----	"	90



## FLETCHER'S GEM WIRE HOLDERS.



Patented.

WITH BOLT AND  
NUT.

Patented.

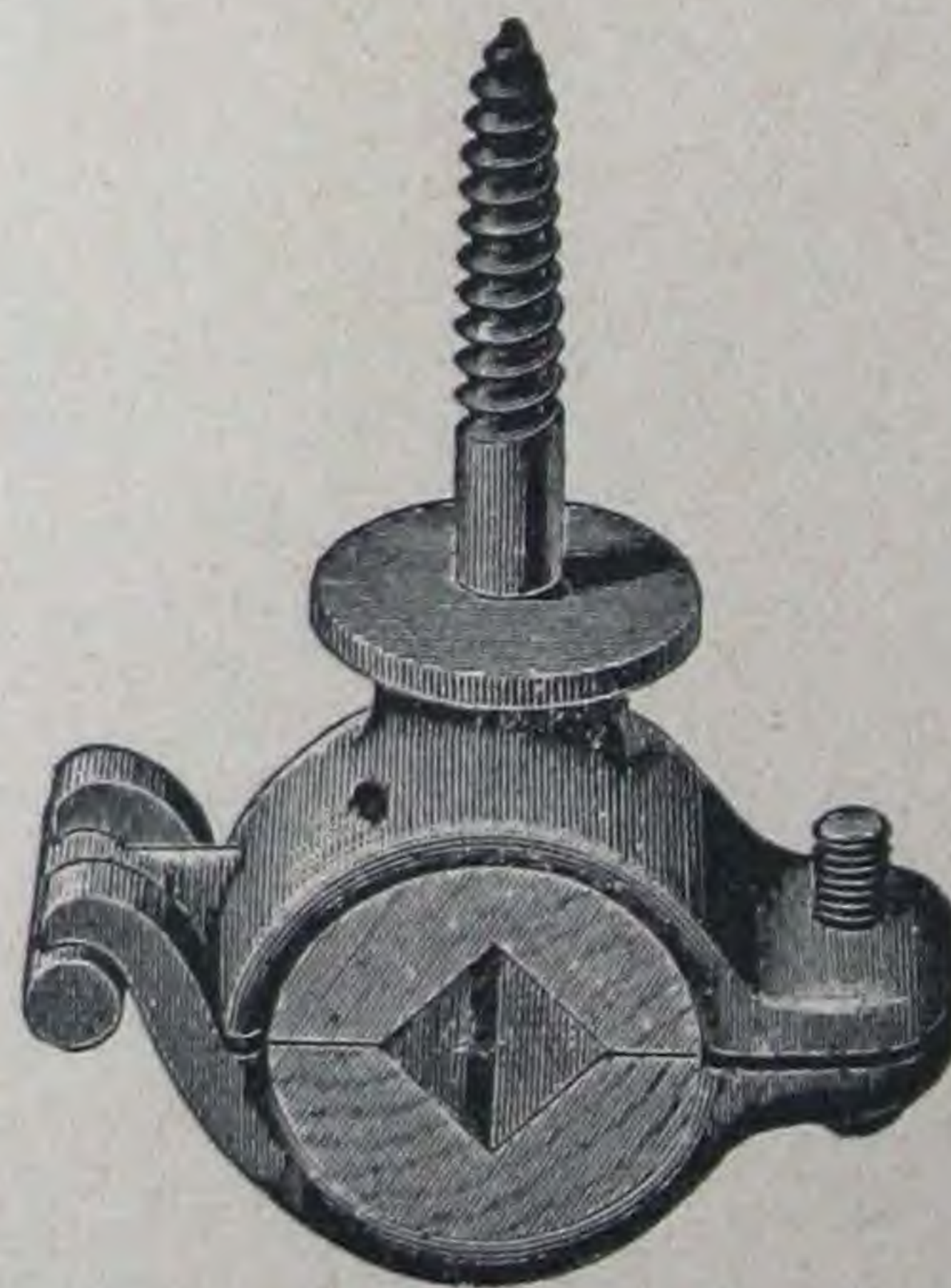
Trade Word.	List No.						Price.
Prevailing	3592	$\frac{3}{16}$	inch opening, wood insulation	per 100			\$10 00
Prevaricate	3593	$\frac{1}{4}$	" " " "	"			12 00
Prevene	3594	$\frac{3}{16}$	" " porcelain	"			12 00
Prevent	3595	$\frac{1}{4}$	" " " "	"			12 00
Pride	3596	$\frac{3}{8}$	" " " "	"			17 50
Primero	3597	$\frac{1}{2}$	" " opalescent glass	"			22 50
Primitive	3598	$\frac{5}{8}$	" " " "	"			22 50
Primrose	3599	$\frac{3}{4}$	" " " "	"			27 50
Prisage	3600	$\frac{7}{8}$	" " " "	"			27 50
Prison	3601	1	" " " "	"			27 50
Prisoner	3602	$1\frac{1}{4}$	" " " "	"			60 00
Privacy	3603	$1\frac{1}{2}$	" " " "	"			70 00
Privado	3604	$1\frac{3}{4}$	" " " "	"			80 00
Private	3605	2	" " " "	"			90 00

## PORCELAIN INSULATION.

Trade Word.	List No.			Price.
Privateer	3606	$\frac{3}{16}$	inch opening per 100	\$10 00
Privation	3607	$\frac{1}{4}$	" " " "	10 00
Privilege	3608	$\frac{3}{8}$	" " " "	15 00

## OPALESCENT GLASS INSULATION.

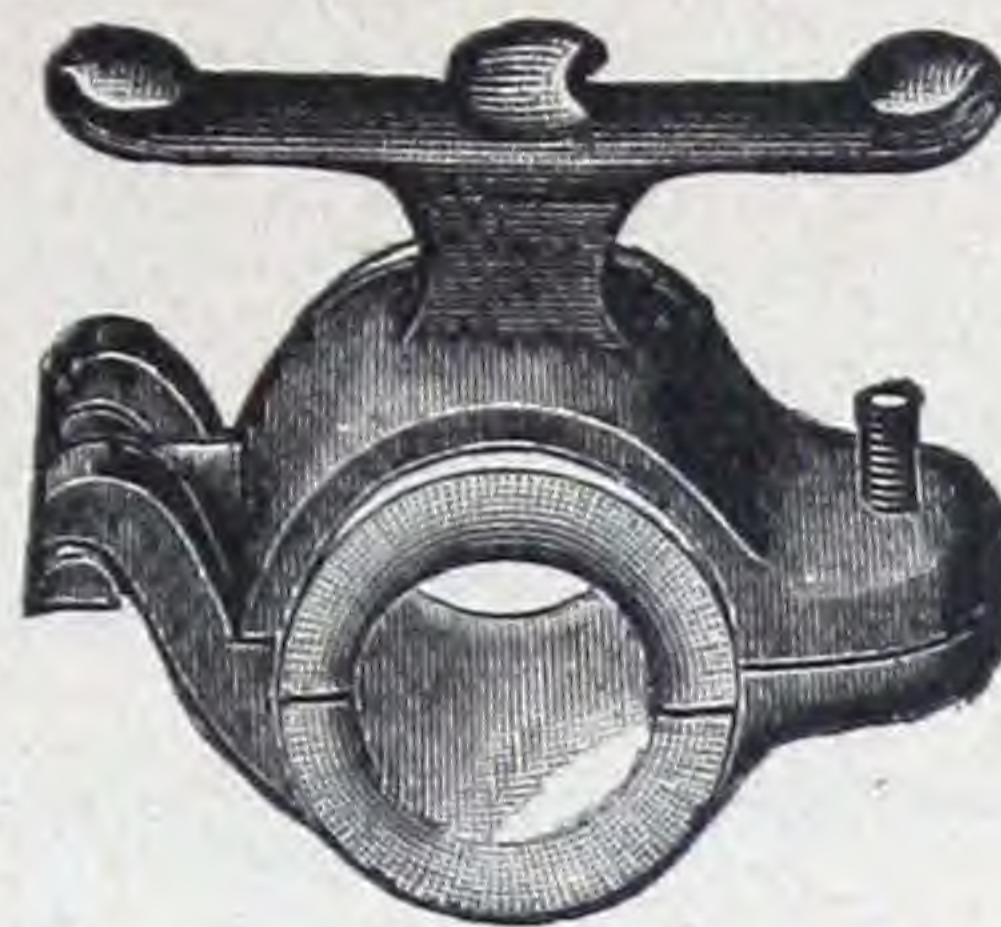
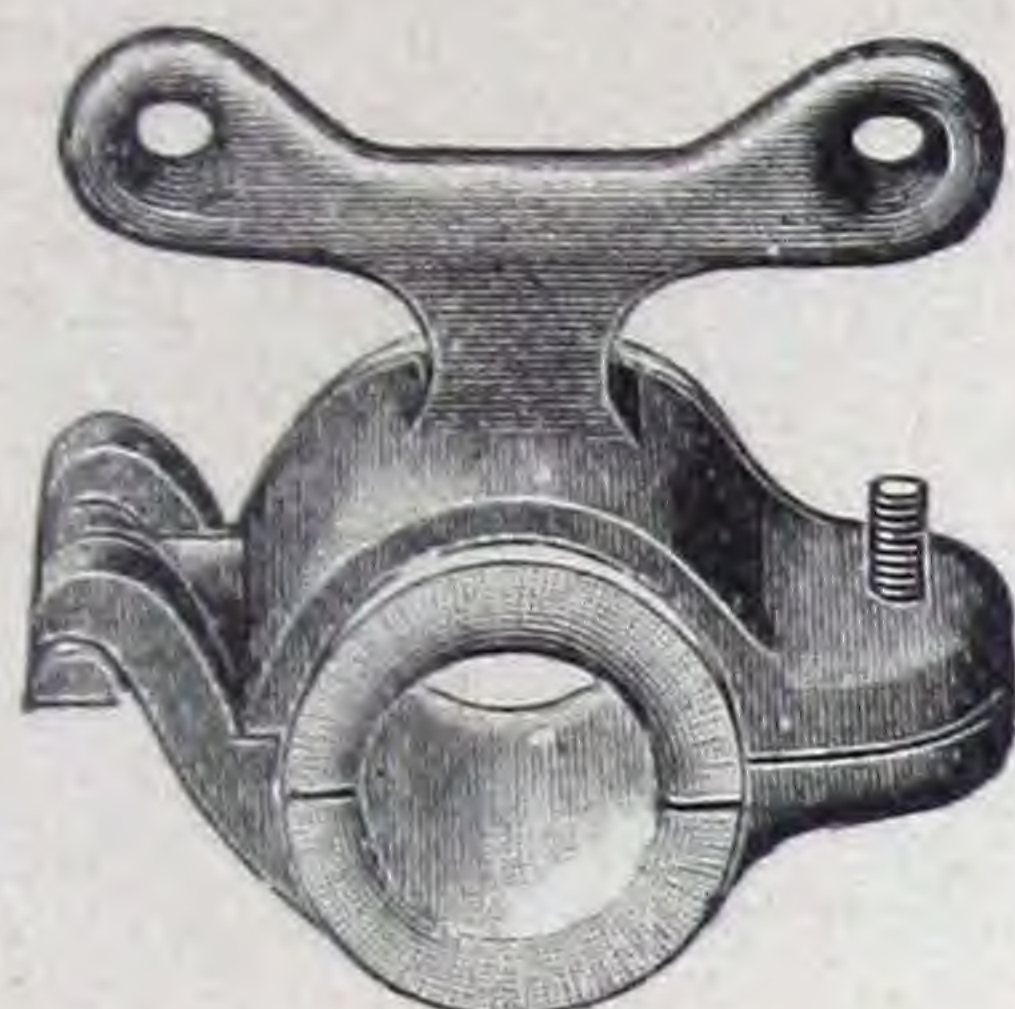
Trade Word.	List No.			Price.
Probang	3609	$\frac{1}{2}$	in. opening per 100	\$20 00
Probate	3610	$\frac{5}{8}$	" " " "	20 00
Probation	3611	$\frac{3}{4}$	" " " "	25 00
Probationer	3612	$\frac{7}{8}$	" " " "	25 00
Probative	3613	1	" " " "	25 00
Probator	3614	$1\frac{1}{4}$	" " " "	50 00
Probe	3615	$1\frac{1}{2}$	" " " "	60 00
Probity	3616	$1\frac{3}{4}$	" " " "	75 00
Problem	3617	2	" " " "	85 00



Patented.



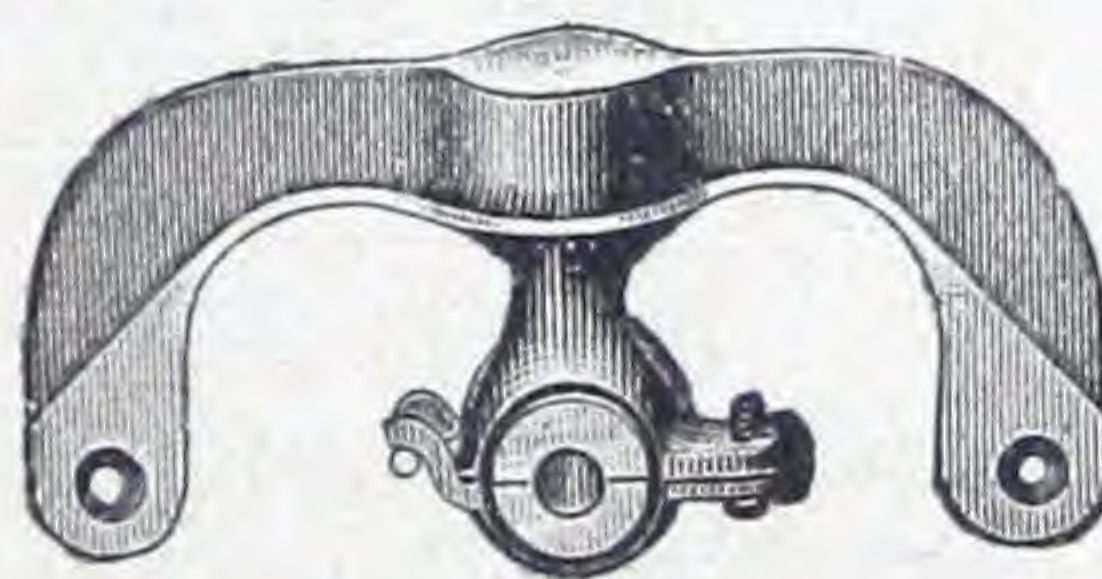
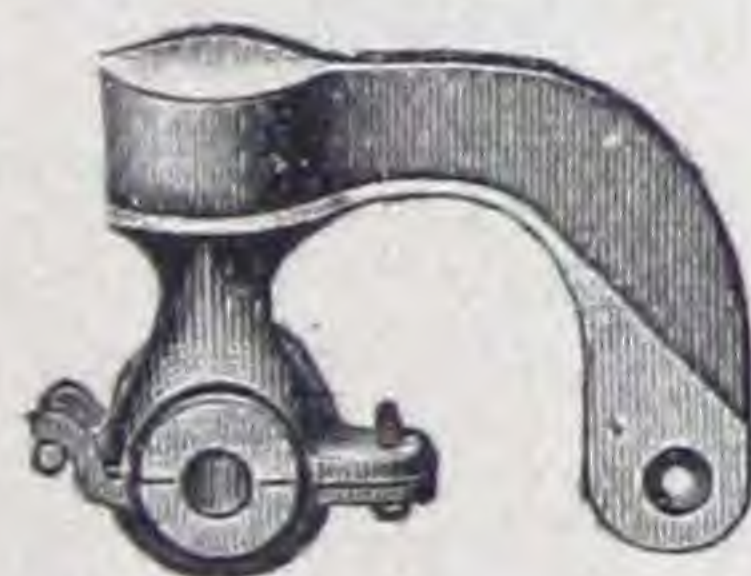
## FEED WIRE INSULATOR.



Designed to be placed on span wire of street railways to carry feed wire independent of cross-arms or poles.

EYES AT TOP.		Opening.	Price.	LOOP AT TOP.	
Trade Word.	List No.			List No.	Trade Word.
Proboscis .....	3618	$\frac{5}{16}$	\$0 15	3626	Proctor
Procacious .....	3619	$\frac{1}{4}$	15	3627	Prodigal
Procacity .....	3620	$\frac{3}{8}$	20	3628	Prodigious
Procedure .....	3621	$\frac{1}{2}$	20	3629	Prodigy
Proceeding .....	3622	$\frac{5}{8}$	25	3630	Prodrome
Process .....	3623	$\frac{3}{4}$	30	3631	Product
Proclaim .....	3624	$\frac{7}{8}$	30	3632	Proface
Proclive .....	3625	1	35	3633	Profane

## GUARD WIRE SUSPENSION INSULATOR.



SINGLE.			Size.	DOUBLE.		
Trade Word.	List No.	Price.		Price.	List No.	Trade Word.
Profaner .....	3634	\$0 15	$\frac{3}{16}$	\$0 20	3642	Project
Professor .....	3635	15	$\frac{1}{4}$	20	3643	Projected
Proffer .....	3636	15	$\frac{3}{8}$	20	3644	Promoting
Profile .....	3637	20	$\frac{1}{2}$	25	3645	Prone
Profusion .....	3638	20	$\frac{5}{8}$	25	3646	Prong
Prognosis .....	3639	25	$\frac{3}{4}$	30	3647	Pronoun
Progress .....	3640	25	$\frac{7}{8}$	30	3648	Pronounce
Prohibit .....	3641	30	1	35	3649	Prop



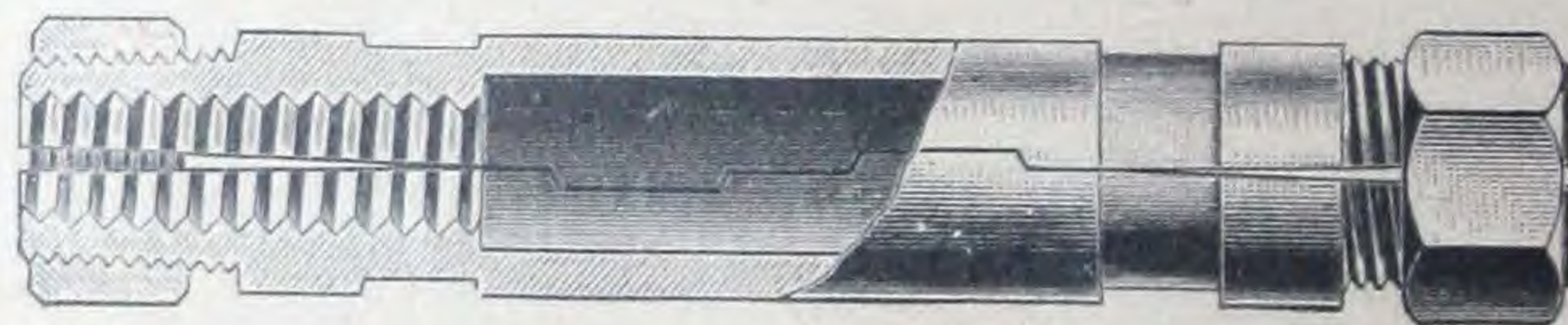
## FLETCHER TREE WIRE HOLDER.



Patented.

Trade Word.	List No.		Price.
Propeller	3640	1 inch opening.....per 100	\$25 00

## FEEDER WIRE SPLICER.



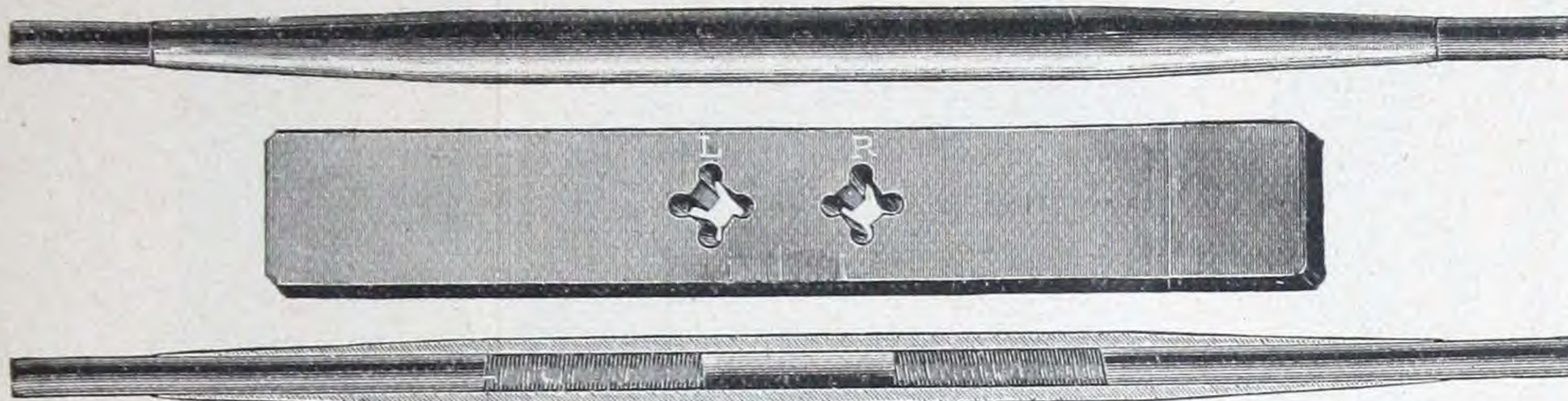
This can be used as a permanent or temporary connector. The halves of the splicer are placed over the abutting ends of the bare wire. The nut is then screwed on the tapered ends of the splicer, which is slightly corrugated on the inside, thus securely clamping the wire. If a permanent splice is desired solder can be poured through a slot provided for this purpose. A joint made in this way is but a trifle larger than the wire, and is of low resistance and great strength.

Trade Word.	List No.		Price.
Propel	3060	For 0 B. & S. wire.....each	\$0 90
Propelled	3061	" 00 " "....."	90
Propense	3062	" 000 " "....."	1 00
Property	3063	" 0000 " "....."	1 00

Special sizes made to order.



## SPLICING TUBE AND THREADING TOOL.



This splicer is made with a right and left-hand thread, cut on the inside. In making connection, ends of trolley wire are threaded with a tool as shown in cut. Splicer is then screwed on ends of wire bringing them together. It has a breaking strain of 3000 pounds.

Trade Word.	List No.			Price.
Prophecy	3050	Splicer .....	each	\$0 80
Prophet	3051	Tool .....	"	1 00

## THREADED TROLLY SPLICER.

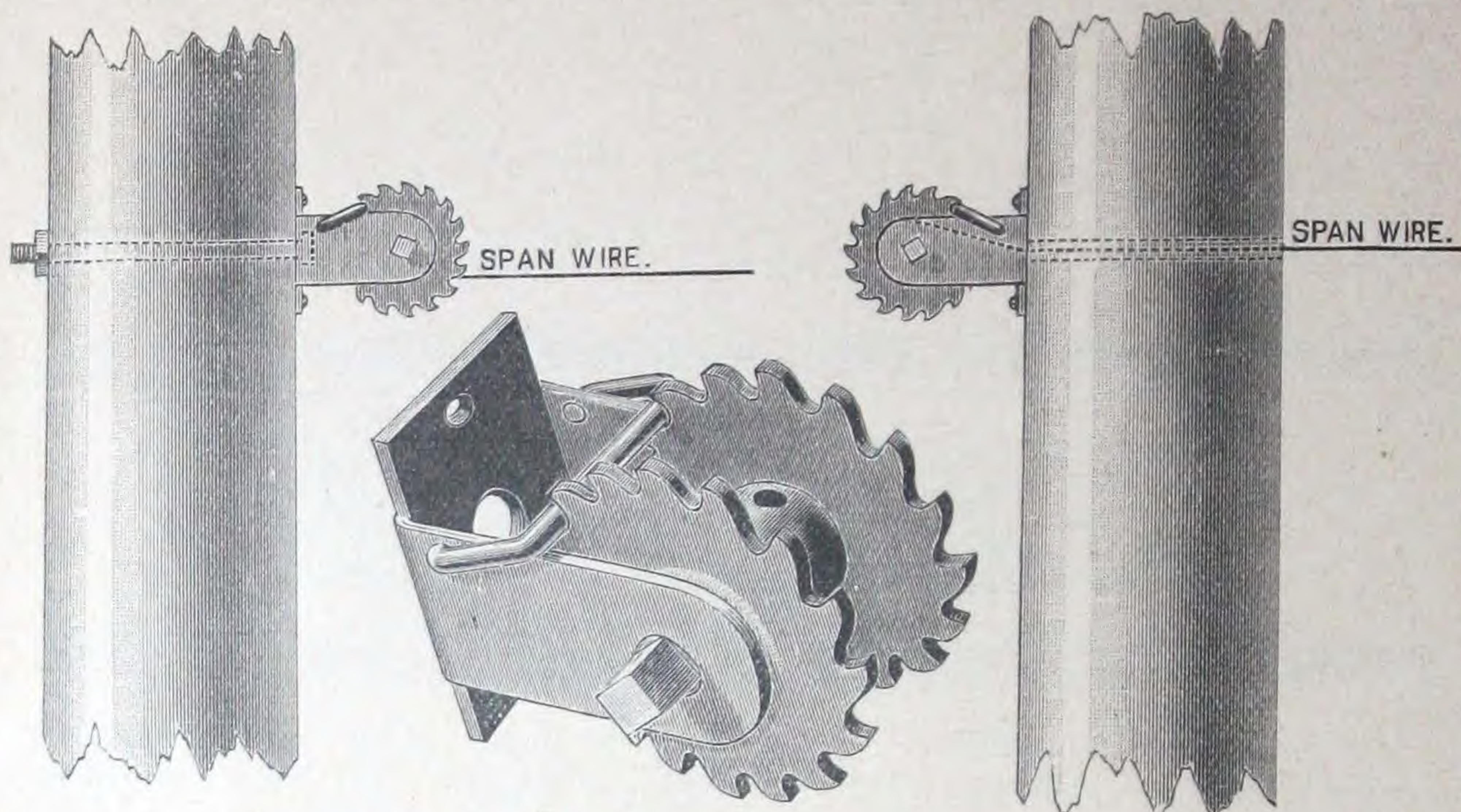


To make a splice the ends of the trolley wire are threaded with a small suitable die furnished for this purpose; the thimbles are then screwed on and fitted into the recesses in the coupler. The two parts of the coupler are then screwed into each other, making a strong, compact splice, but a trifle larger in diameter than the wire itself.

Trade Word.	List No.			Price.
Propound	3052	Splicer .....	each	\$1 00
Propounding	3053	Tool .....	"	70



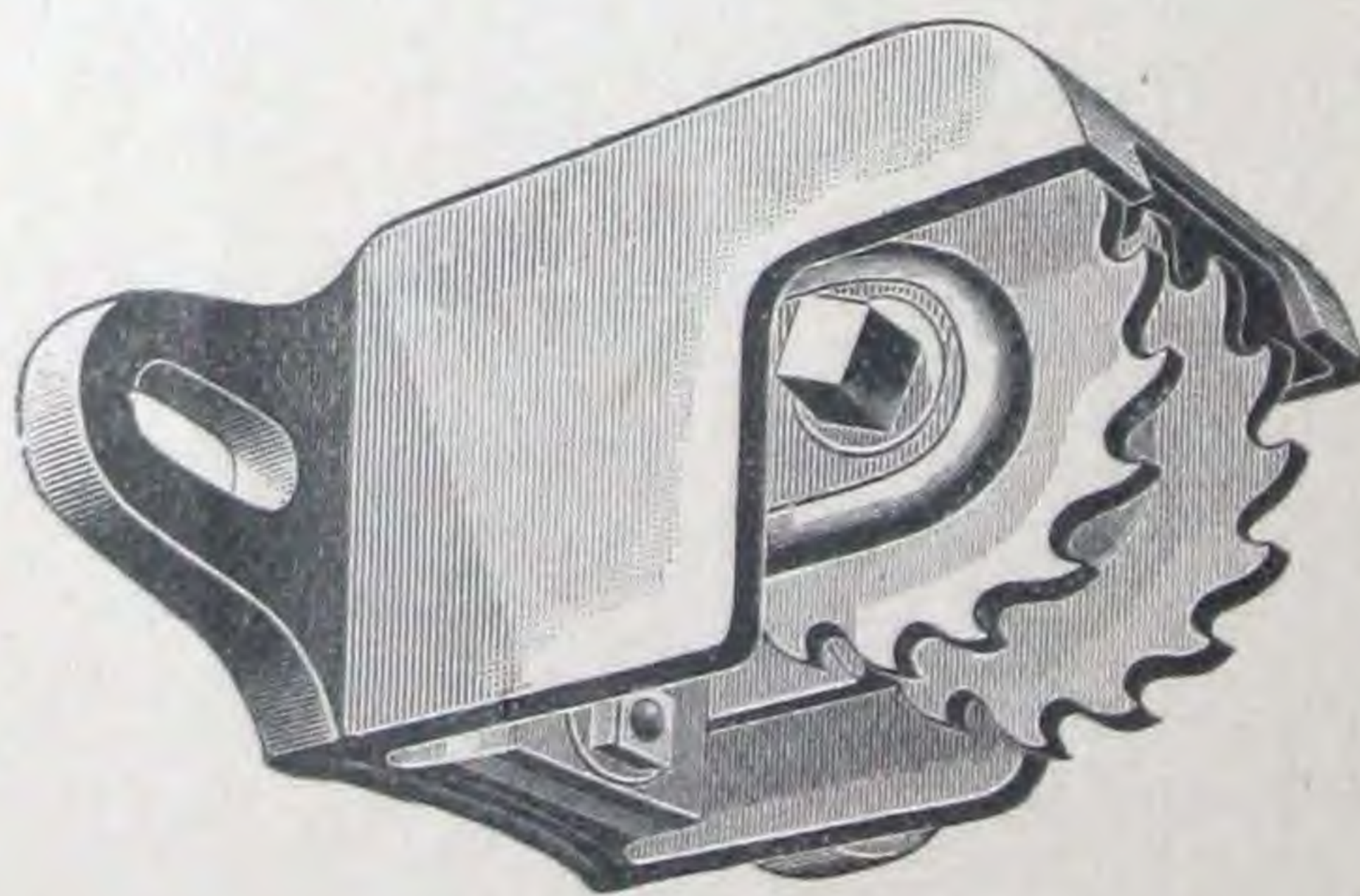
## SELF-LOCKING POLE RATCHET.



This ratchet is self-locking, and holds span wire firmly at any position drawn to. The locking attachment renders it impossible for span wire to escape, as the result of pole being jarred. Frame is stamped from sheet steel and is consequently very strong. This ratchet may be used on the inside (or street side) of pole, or on the outside (or sidewalk side) of pole. When used on inside of pole, it is necessary to use a lag bolt to hold ratchet in place; the lag bolt can be passed through opening in frame, and through the pole without removing the wheel. When used on outside of pole it is not necessary to use any lag bolt, as span wire is passed through hole in pole and opening in back of frame and holds ratchet firmly against pole.

Trade Word.	List No.	Price.
Propped	3058	\$0 60

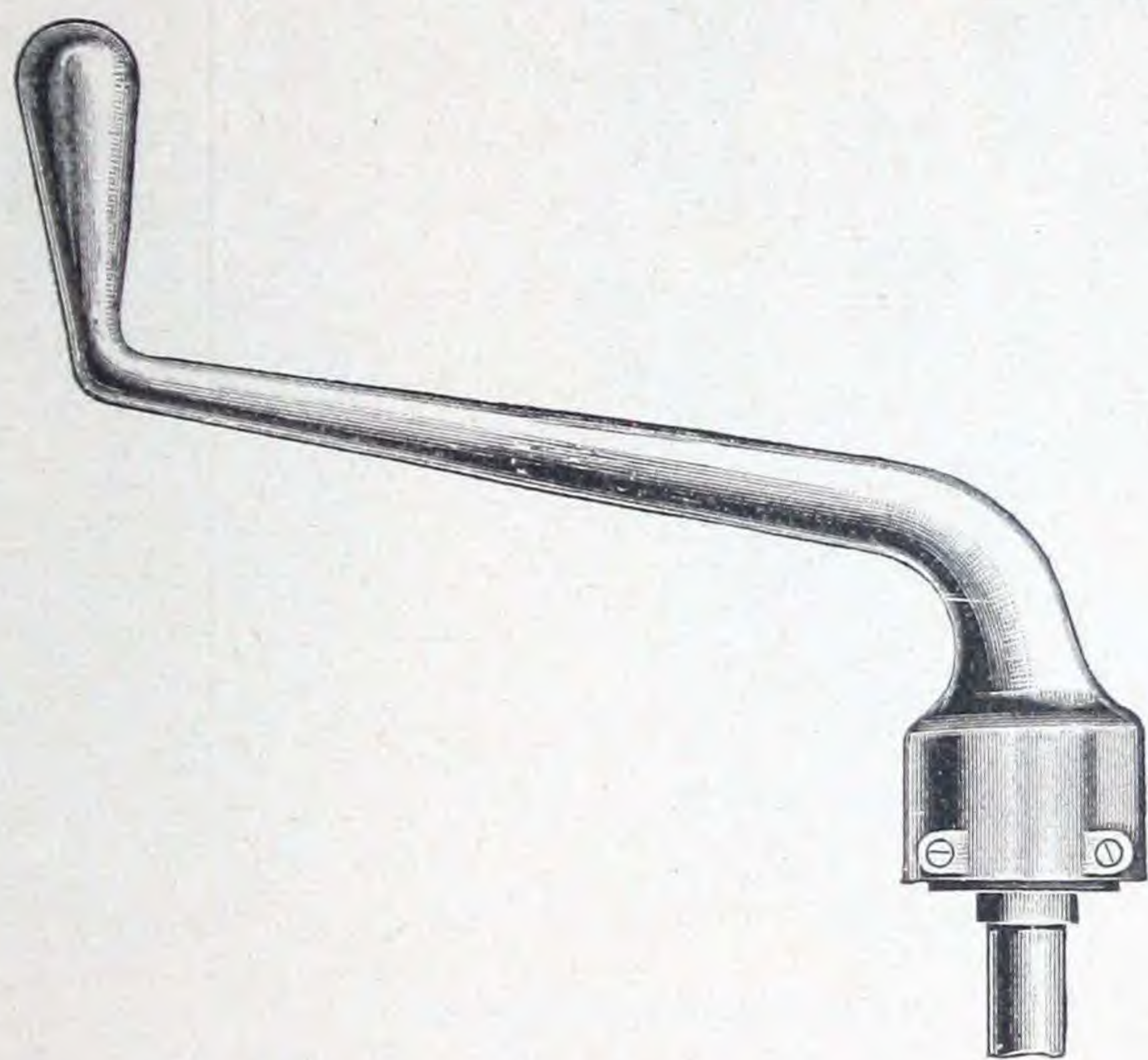
## INSULATED POLE RATCHET. FOR INSULATING SPAN WIRE FROM POLE.



Trade Word.	List No.	Price.
Prosaic	3059	each \$1 90



RATCHET BRAKE HANDLE.



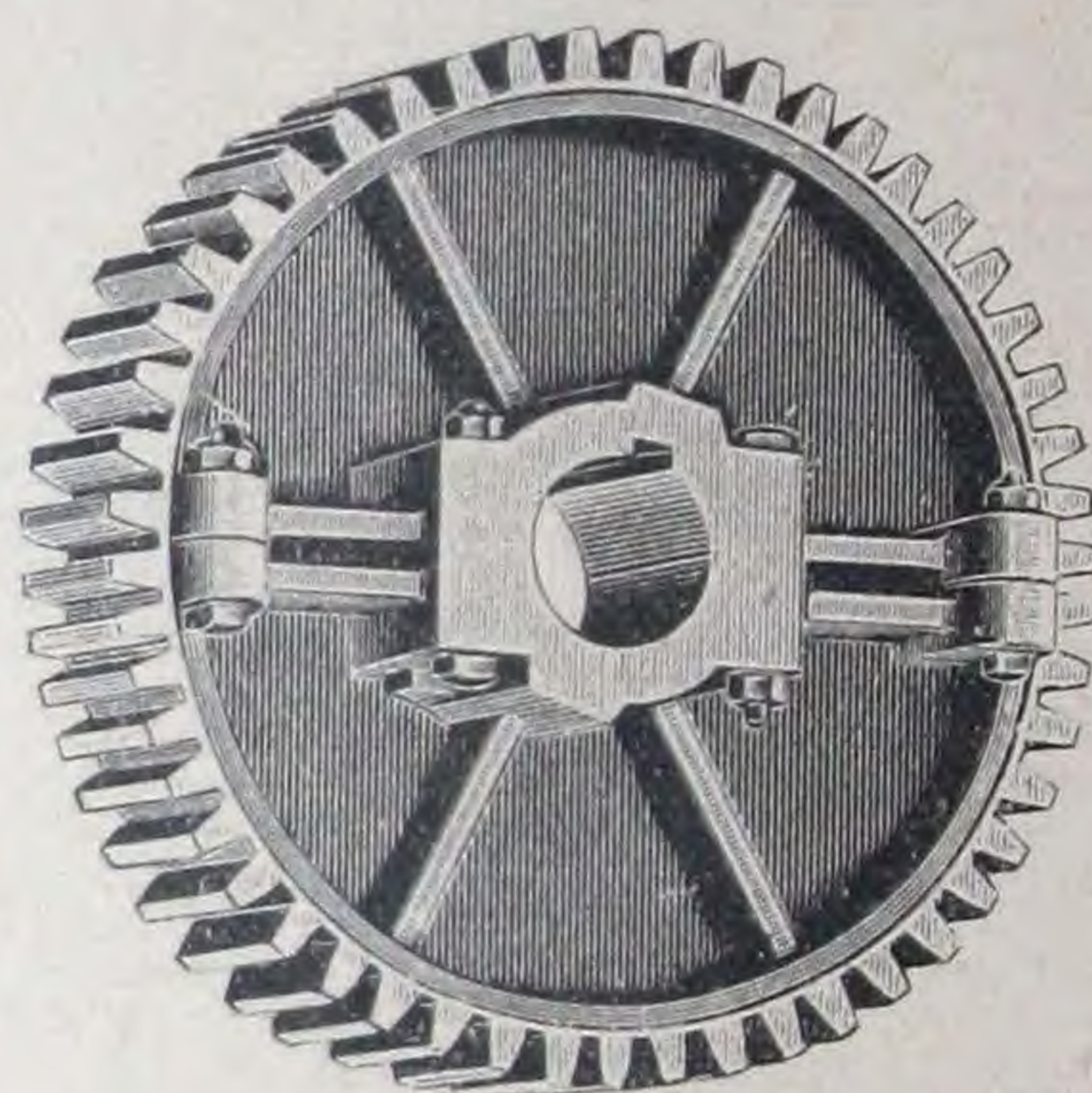
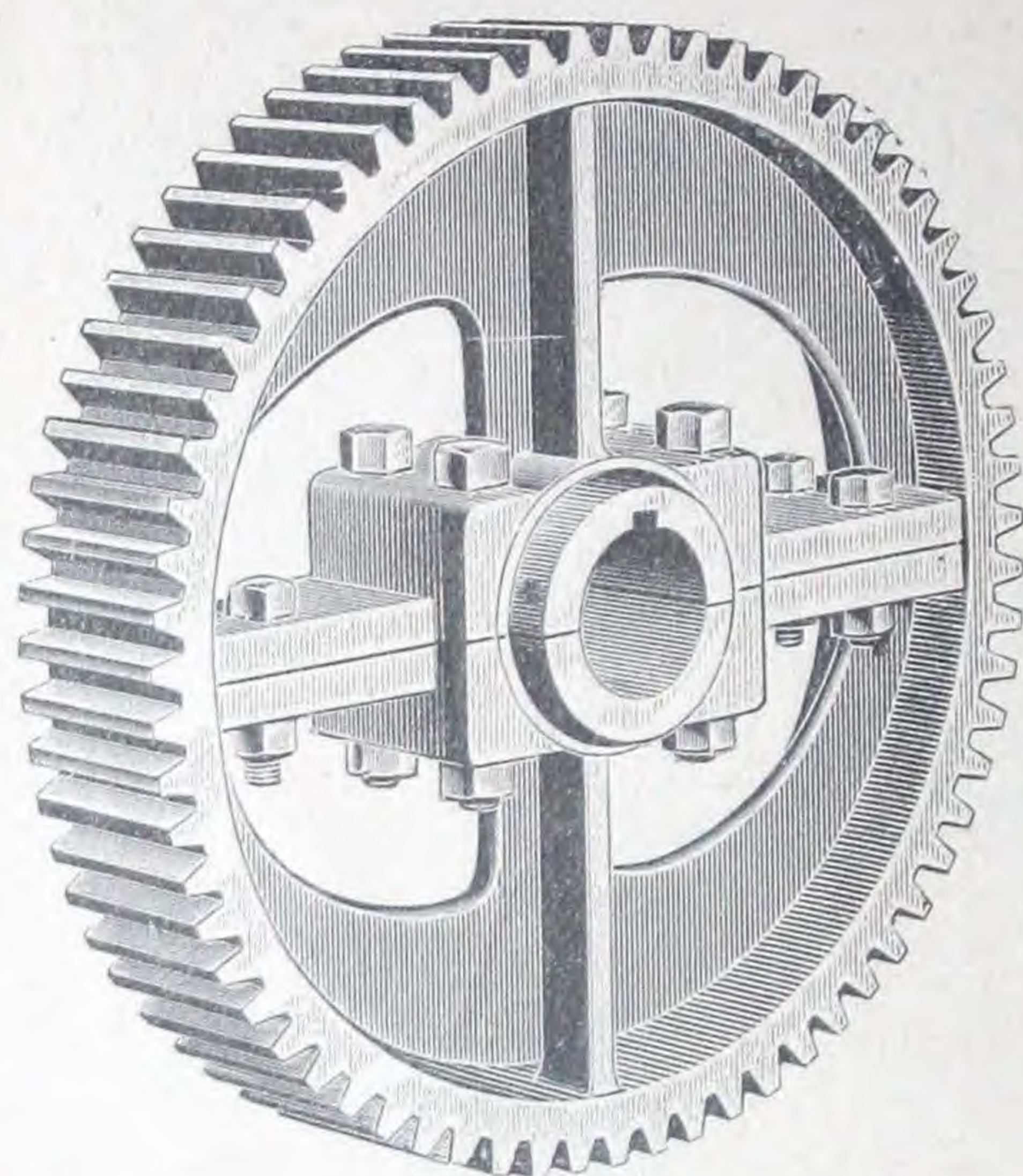
The working parts of this brake consists of two ratchet plates, held in position by a compression spring. It has no delicate parts to wear out and is practically indestructible. We guarantee it for strength and duarability.

Trade Word.	List No.		Price.
Prosalist	3064	Bronze ----- each	\$7 50
Proscribe	3065	Malleable, nickel-plated ----- "	5 00
Prose	3066	" painted ----- "	4 50



## STEEL AND IRON GEARS.

## AXLE GEARS.



Trade Word.	List No.					Price.	
						Steel.	Cast Iron.
Prosecute	3068	Thomson-Houston system, F.	20			\$14 50	\$6 90
Proser	3069	" " "	30			15 60	7 80
Prosing	3070	" " "	40			17 50	8 15
Prosodist	3071	Thomson-Houston	"	S. R. G. & W. P.		27 50	11 20
Prosody	3072	Edison or Sprague	"	No. 6		16 00	7 80
Prosper	3073	" " "	"	8		16 00	7 80
Prosperous	3074	" system S. R. 56 teeth,	"	14			12 50
Prostate	3075	" " " 63	"	14			14 10
Protractor	3076	" " " 65	"	14			14 35
Protege	3077	" " " 58	"	16			13 75
Protend	3078	" " " 69	"	16			15 00
Protended	3079	Westinghouse D. R.					8 45
Protense	3080	" S. R. G.				27 50	11 20
Protest	3081	Wightman, type 20					11 20

In ordering Edison S. R. Gears, always give width of face keyway, diameter of bore and number of teeth required.

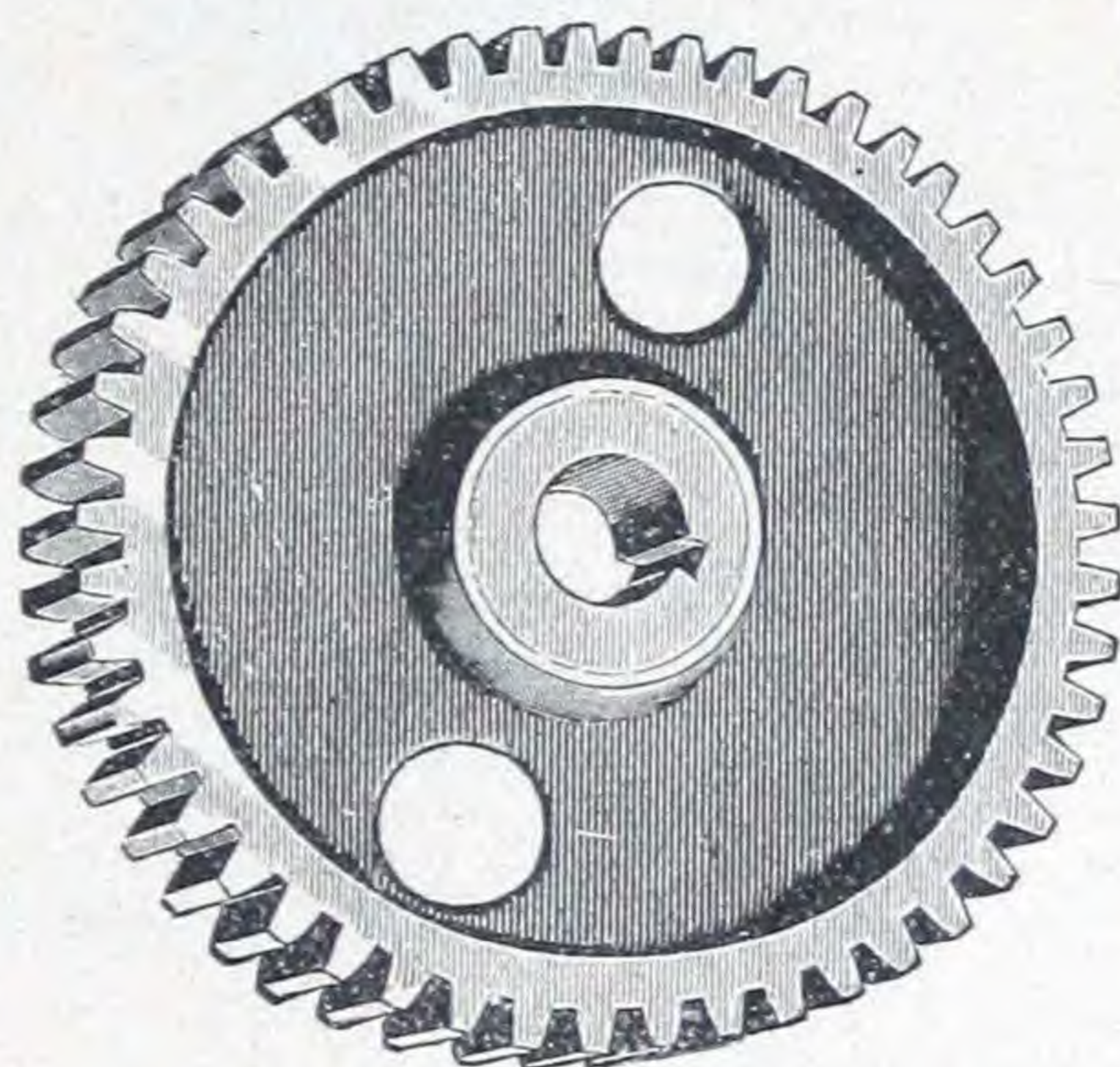
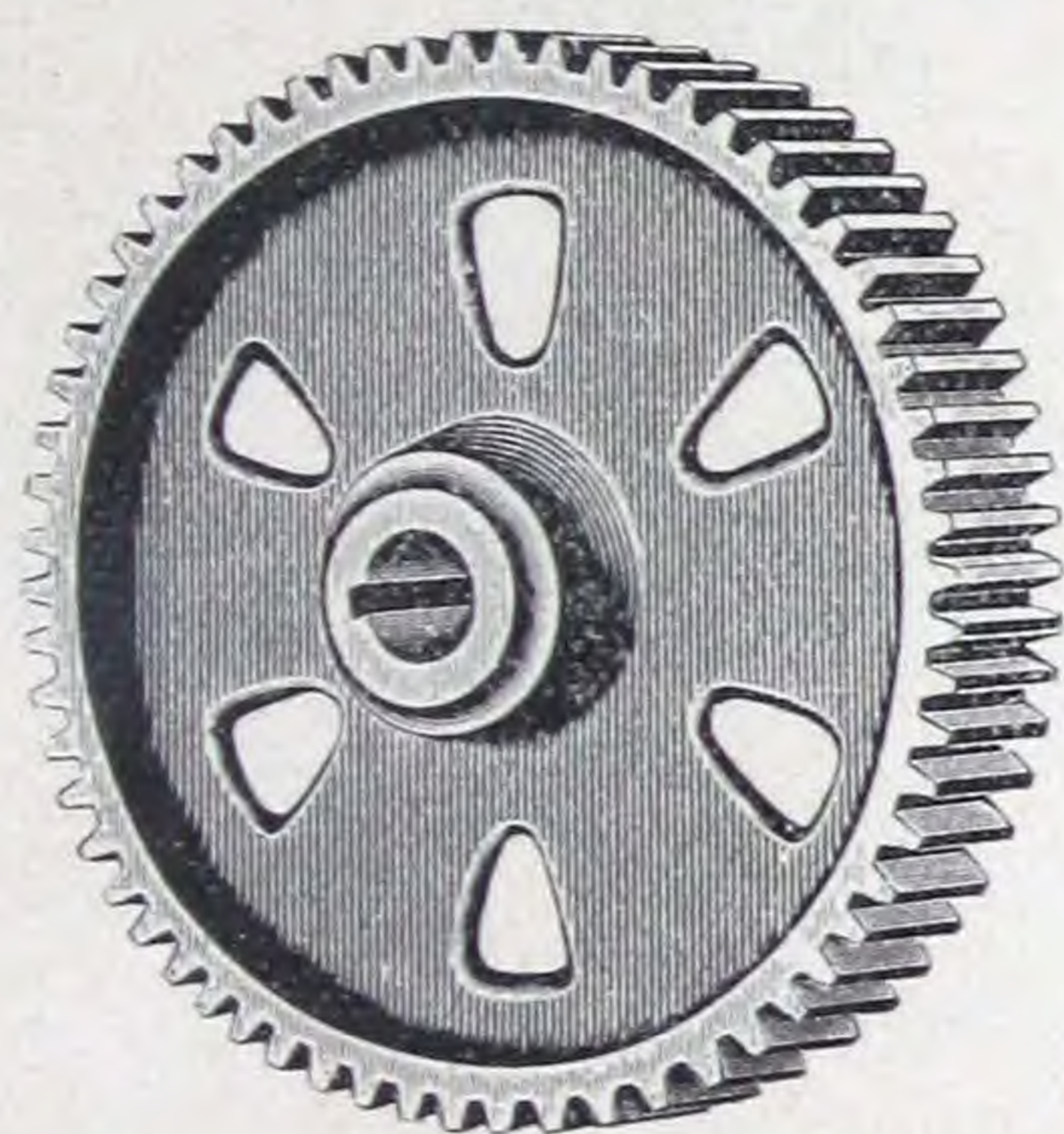
Special bores charged at the rate of ten per cent extra.

All gears standard size. Extra heavy patterns.



## STEEL AND IRON GEARS.—Continued.

## INTERMEDIATE GEARS.

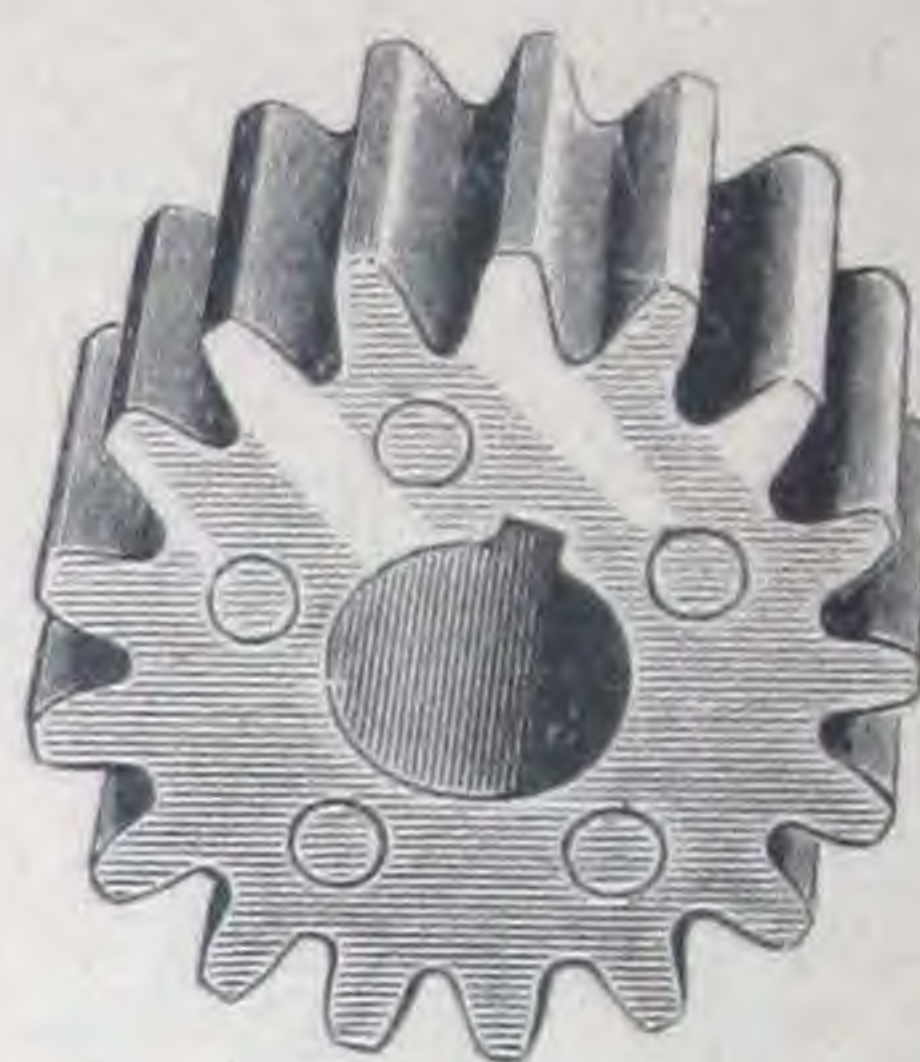
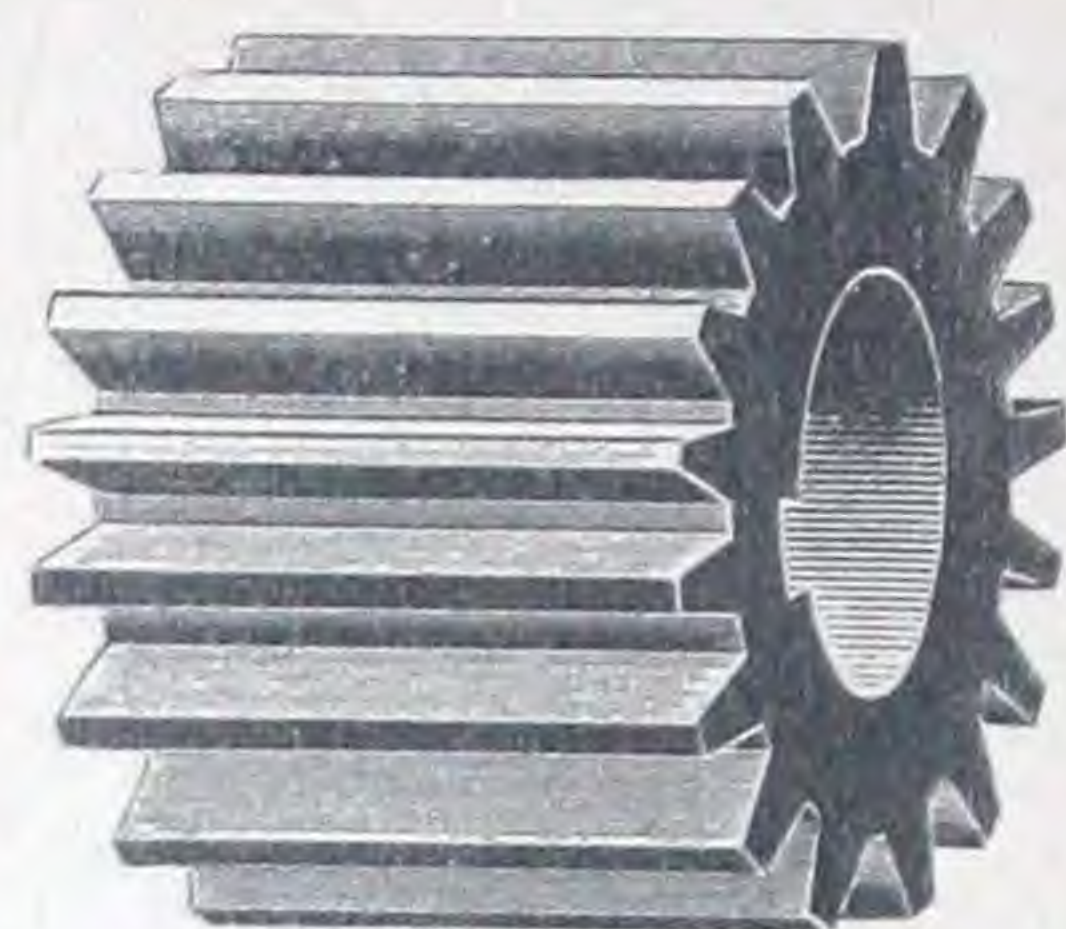


Trade Word.	List No.				Price.	
					Steel.	Cast Iron.
Protested	3651	Thomson-Houston system, F. 20	-----		\$10 65	\$5 00
Proteus	3652	“ “ “ “ 30	-----		12 50	5 25
Prothesis	3653	“ “ “ “ 40	-----		14 00	6 25
Protocal	3654	Edison or Sprague “ No. 6, 3 $\frac{3}{4}$ in face			12 00	5 00
Protopope	3655	“ “ “ “ 6, 4 “			12 75	5 20
Protoplast	3656	“ “ “ “ 6, 4 $\frac{1}{4}$ “			12 75	5 20
Protosalt	3657	“ “ “ “ No. 8, -----			12 75	5 20
Prototype	3658	Westinghouse D. R. -----			13 75	5 50



## STEEL AND RAWHIDE PINIONS.

## INTERMEDIATE PINIONS.



Trade Word.	List No.		Price.	
			Steel.	Rawhide.
Protract	3082	Thomson-Houston system, F. 20	\$3 49	\$5 43
Protracted	3083	" " " " 30	4 00	7 49
Protrude	3084	" " " " 40	4 50	8 75
Protruding	3085	Edison or Sprague " No. 6	4 10	7 00
Protrusion	3086	Westinghouse D. R.	4 75	8 00

## ARMATURE PINIONS.

Trade Word.	List No.		Price.	
			Steel.	Rawhide.
Protrusive	3087	Thomson-Houston system, F. 20	\$3 25	\$4 55
Proud	3088	" " " " 30	3 40	6 72
Prouder	3089	" " " " 40	4 00	7 49
Proudest	3090	" " " " S. R. G. & W. P.	3 45	6 50
Proudly	3091	Edison or Sprague, $3\frac{3}{4}$ inch face, No. 6	2 65	5 00
Provable	3092	" " 4 " " 6	3 00	5 00
Provably	3093	" " $4\frac{1}{4}$ " " 6	3 10	5 25
Prove	3094	" S. R. 13 teeth, No. 14	5 50	---
Proven	3095	" " 15 " " 14	5 75	---
Provender	3096	" " 22 " " 14	10 00	---
Proverb	3097	" " 16 " " 16	6 25	---
Provide	3098	" " 19 " " 16	7 80	---
Providence	3099	" " 14 " " 20	5 75	---
Provider	3100	" " 15 " " 20	5 75	---
Province	3101	Westinghouse D. R.	4 25	6 50
Provincial	3102	" S. R.	6 00	8 50
Provine	3103	Wightman, type 20	4 05	---



## BEARINGS.

## AXLE BEARINGS.

Trade Word.	List No.		Price.
Provision	3104	Thomson-Houston, F. 20	\$4 00
Proviso	3105	" " " 30	4 75
Provisor	3106	" " " 40	5 00
Provisory	3107	" " S. R. G.	5 25
Provoke	3108	" " W. P. 30	5 50
Provoking	3109	" " " 50	5 50
Provost	3110	Edison, No. 6, or Sprague	3 75
Prow	3111	Westinghouse, D. R.	5 00
Prowled	3112	" S. R.	5 00

## INTERMEDIATE BEARINGS.

Trade Word.	List No.		Price.
Prowess	3113	Thomson-Houston, F. 20	\$2 50
Prowl	3114	" " " 20 A	3 50
Prowler	3115	" " " 30	3 00
Prowling	3116	" " " 30 A	4 00
Proxene	3117	" " " 40	2 00
Proximate	3118	Edison, No. 6, or Sprague	3 25
Proxime	3119	Westinghouse, D. R.	4 00

## ARMATURE BEARINGS.

## GEAR END.

Trade Word.	List No.		Price.
Proximity	3120	Thomson-Houston, F. 20	\$2 00
Proxy	3121	" " " 20 A	3 25
Prude	3122	" " " 30	3 00
Prudence	3123	" " " 30 A	4 00
Prudent	3124	" " " 40	1 75
Prudently	3125	" " S. R. G.	3 25
Prudery	3126	" " W. P. 30	2 50
Prudish	3127	" " " 50	3 00
Pruina	3128	Edison, No. 6, or Sprague	2 25
Prune	3129	Westinghouse, D. R.	4 50
Prunella	3130	" S. R.	4 50

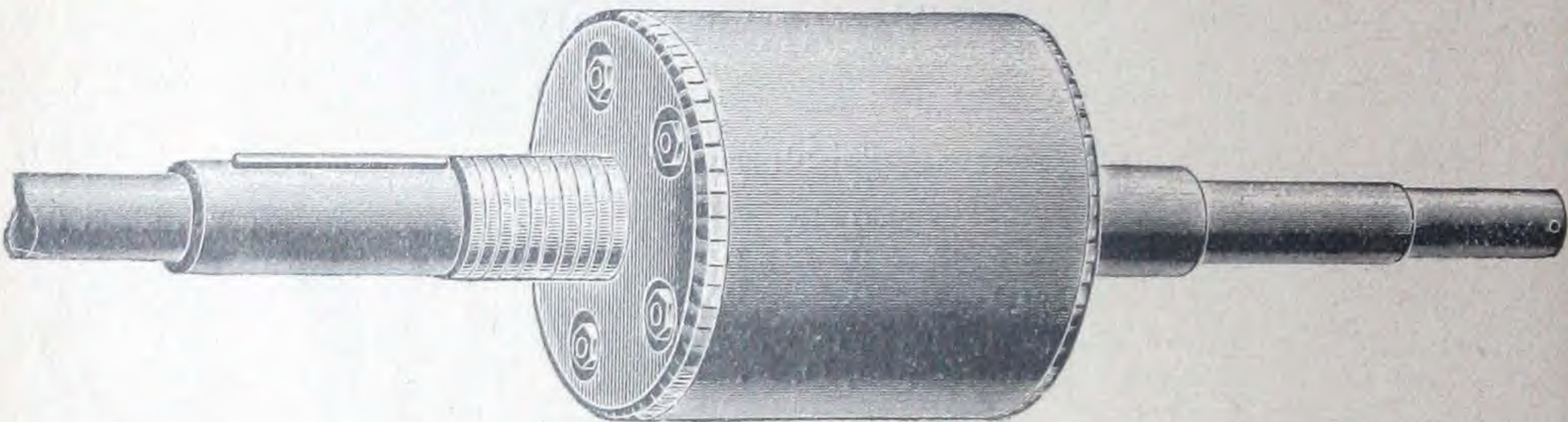
## COMMUTATOR END.

Trade Word.	List No.		Price.
Prunello	3131	Thomson-Houston, F. 20	\$1 75
Pruner	3132	" " " 20 A	2 90
Pruning	3133	" " " 30	2 90
Prurient	3134	" " " 30 A	3 75
Prurigo	3135	" " " 40	1 65
Prussian	3136	" " S. R. G.	3 00
Prussiate	3137	" " W. P. 30	2 00
Prussic	3138	" " " 50	2 50
Psalm	3139	Edison, No. 6, or Sprague	2 10
Psalmody	3140	Westinghouse, D. R.	3 50
Psalmodist	3141	" S. R.	3 50



MOTOR AND GENERATOR ARMATURE  
CORES.

READY TO WIRE.

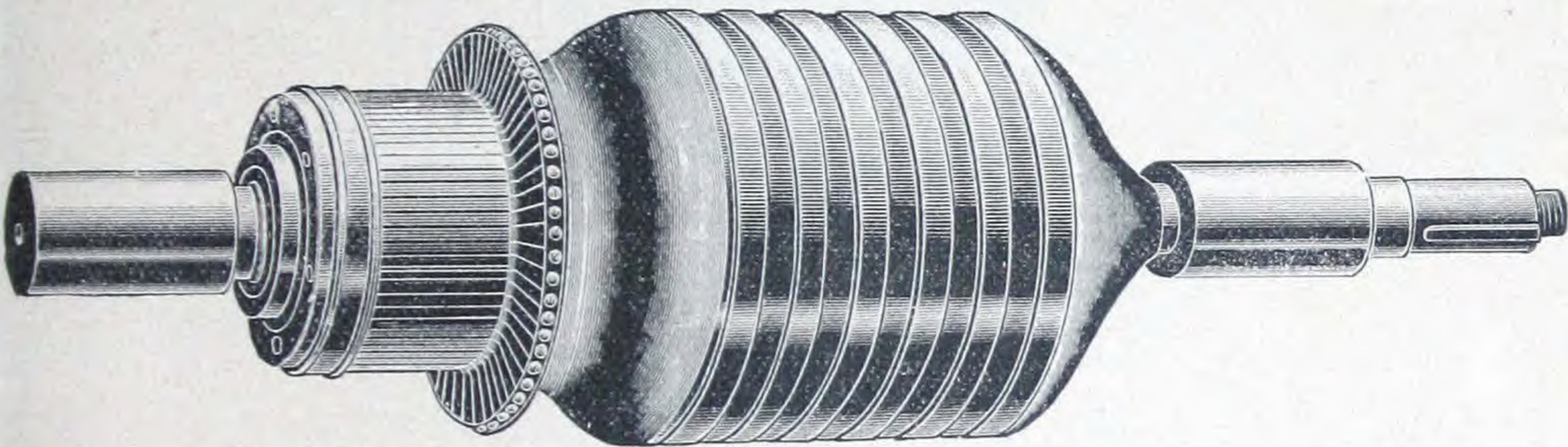


Trade Word.	List No.		Price.
Psalmodic	3142	Thomson-Houston, F. 20 and F. 20 A	\$75 00
Psalter	3143	" " " 30 " " 30 "	85 00
Psammite	3144	" " " 40	93 75
Psammitic	3145	" " S. R. G.	135 00
Pseudo	3146	" " W. P. 50	229 58
Psoas	3147	" " " 30	221 35
Pubes	3148	Westinghouse, D. R. motor No. 1	85 00
Public	3149	" " S. R. G. " " 3	164 00
Publican	3150	Edison, D. R. motor, No. 6	62 50
Publication	3151	" " " " 8	62 50
Publicish	3152	" " S. R. G. " " 14	221 35
Publicly	3153	Short standard, D. R. motor	120 00
Publicness	3154	Rae motor	93 75
Publish	3155	Thomson-Huston, D. 62 generator	247 23
Published	3156	Edison, No. 16 generator	203 12



RAILWAY, MOTOR AND GENERATOR  
ARMATURES.

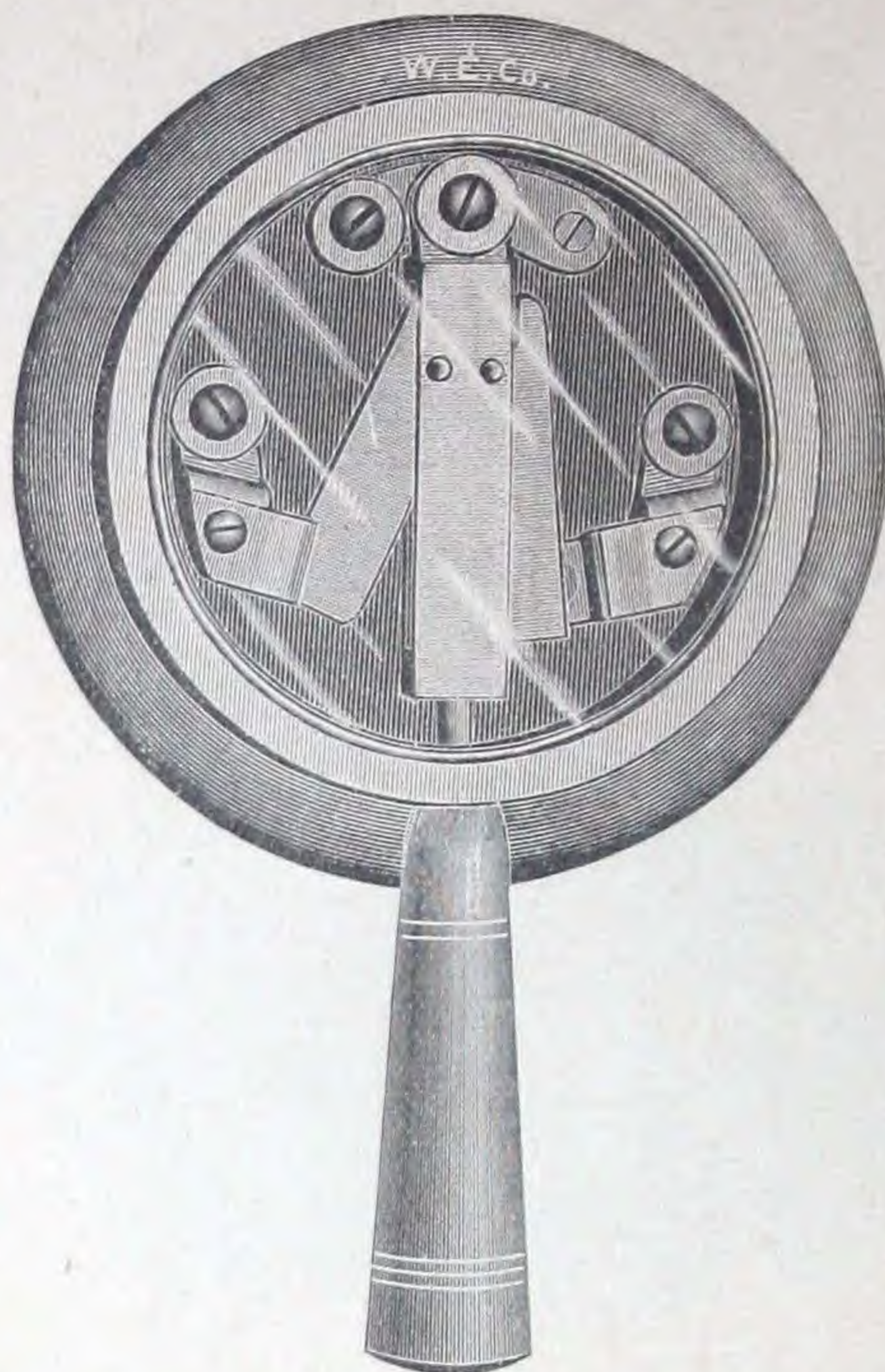
COMPLETE WITH COMMUTATORS.



Trade Word.	List No.		Price.
Publishing	3157	Thomson-Houston, F. 20 and F. 20 A	\$170 75
Publishment	3158	“ “ “ 30 “ “ 30 “	185 00
Puccoon	3159	“ “ “ 40	210 00
Pucelage	3160	“ “ S. R. G.	252 19
Puceron	3161	“ “ W. P. 50	402 10
Puck	3162	“ “ “ 30	381 30
Pucker	3163	Westinghouse, D. R. motor No. 1	218 75
Pudder	3164	“ S. R. G. “ “ 3	343 75
Pudding	3165	Edison, D. R. motor No. 6	143 12
Puddle	3166	“ “ “ “ 8	158 75
Puddling	3167	“ S. R. G. “ “ 14	399 37
Pudency	3168	Short standard, D. R. motor	259 69
Pudenda	3169	Rae motor	231 27
Pudic	3170	Thomson-Houston, D. 62 generator	625 00
Puerile	3171	Edison, No. 16 generator	525 00



## HEAD-LIGHT SWITCH.

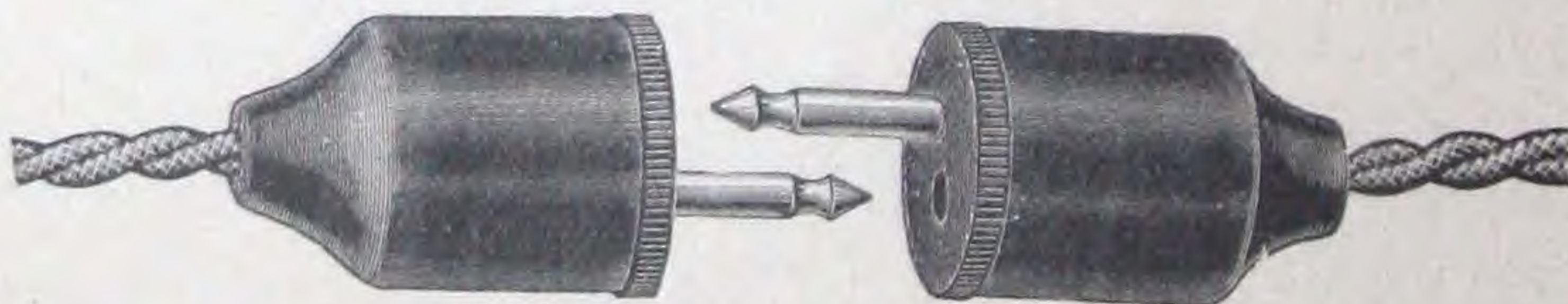


By referring to the above cut it will be seen that this is a quick break 3-pole switch, and is just what is wanted for changing lights from one end of the car to the other, whether for head-light or platform use.

This switch is built on an entirely new principle, and makes a perfect contact.

Trade Word.	List No.	Price.
Puff	3172	each \$1 85

## TRAILER CONNECTOR.



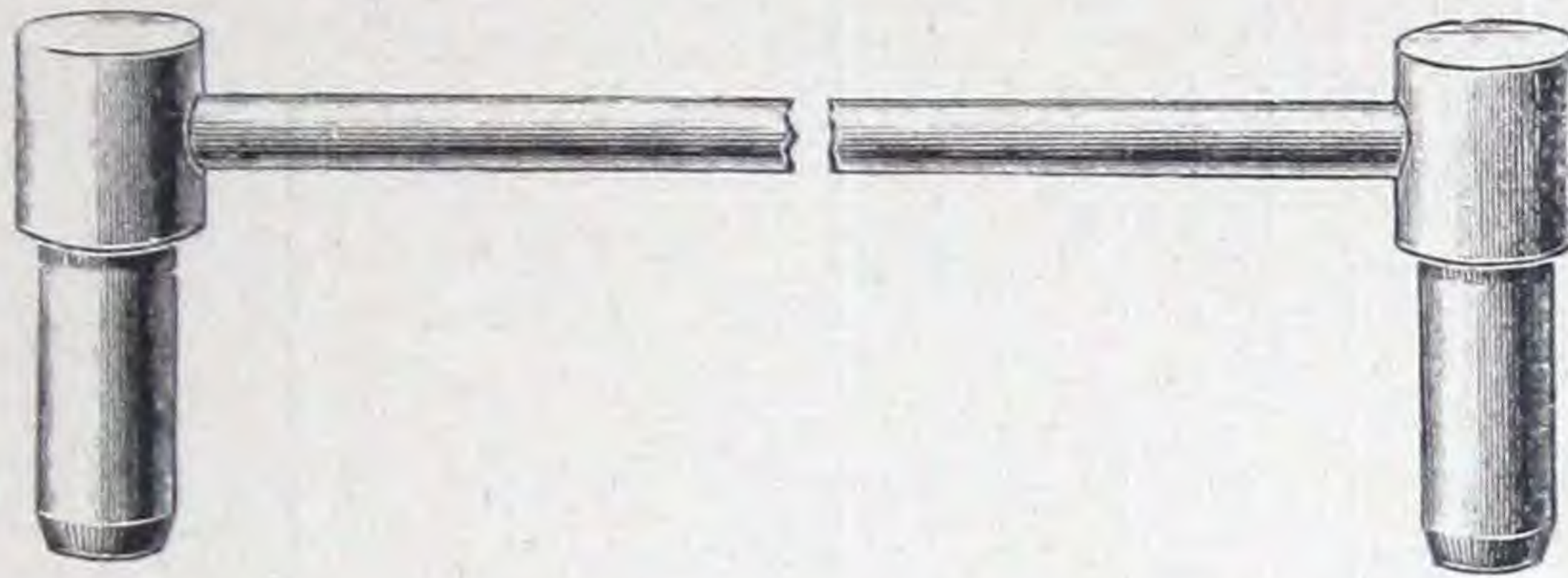
For connecting motor and trail cars for lighting purposes.

Trade Word.	List No.	Price.
Puffer	3173	each \$1 90



## RAIL BONDS.

## GALVANIZED IRON BONDS.



Manufactured from No. 6 B. W. G. iron wire.

Trade Word.	List No.	Length of Bond, Inches.	Size of Rivet, Inches.	Price per Hundred.	Trade Word.	List No.	Length of Bond, Inches.	Size of Rivet, Inches.	Price per Hundred.
Puffing .....	3174	24	$\frac{1}{4}$	\$5 50	Pugil .....	3659	60	$\frac{1}{4}$	\$7 25
Puffy .....	3175	24	$\frac{5}{16}$	5 75	Pugilism .....	3660	60	$\frac{5}{16}$	7 50
Pug .....	3176	24	$\frac{3}{8}$	6 00	Pugilist .....	3661	60	$\frac{3}{8}$	7 75
Pugfaced .....	3177	30	$\frac{1}{4}$	6 25	Pugilistic .....	3662	72	$\frac{1}{4}$	9 50
Pugging .....	3178	30	$\frac{5}{16}$	6 50	Pugnacious .....	3663	72	$\frac{5}{16}$	9 75
Pugh .....	3179	30	$\frac{3}{8}$	6 75	Pugnacity .....	3664	72	$\frac{3}{8}$	10 00

## CROSS CONNECTING IRON BONDS.

Trade Word.	List No.	Length of Bond, Inches.	Length of Cross Connecting Bond, Inches.	Size of Rivet, Inches.	Price per Hundred.	Trade Word.	List No.	Length of Bond, Inches.	Length of Cross Connecting Bond, Inches.	Size of Rivet, Inches.	Price per Hundred.
Pull .....	3180	24	60	$\frac{1}{4}$	\$15 25	Sarcenet .....	3665	30	60	$\frac{1}{4}$	\$16 50
Pullback .....	3181	24	60	$\frac{5}{16}$	15 50	Sarcology .....	3666	30	60	$\frac{5}{16}$	17 00
Pulled .....	3182	24	60	$\frac{3}{8}$	16 00	Sardine .....	3667	30	60	$\frac{3}{8}$	17 50



RAIL BONDS—Continued.

COPPER RAIL BONDS.

Manufactured from No. 4 B. & S. tinned copper wire and iron rivets.

Trade Word.	List No.	Length of Bond, Inches.	Size of Rivet, Inches.	Price per Hundred.	Trade Word.	List No.	Length of Bond, Inches.	Size of Rivet, Inches.	Price per Hundred.
Pulley	3183	24	$\frac{1}{4}$	\$8 25	Pulsatory	3668	60	$\frac{1}{4}$	\$20 00
Pullen	3184	24	$\frac{5}{16}$	8 75	Pulse	3669	60	$\frac{5}{16}$	20 25
Pullee	3185	24	$\frac{3}{8}$	9 00	Pulsific	3670	60	$\frac{3}{8}$	20 75
Pullet	3186	30	$\frac{1}{4}$	9 50	Pulsion	3671	72	$\frac{1}{4}$	22 00
Pullicat	3187	30	$\frac{5}{16}$	10 00	Pulverate	3672	72	$\frac{5}{16}$	22 50
Pulmonary	3188	30	$\frac{3}{8}$	10 50	Pulverize	3673	72	$\frac{3}{8}$	23 00

CROSS CONNECTING COPPER BONDS.

Trade Word.	List No.	Length of Bond, Inches.	Length of Cross Connecting Bond, Inches.	Size of Rivet, Inches.	Price per Hundred.	Trade Word.	List No.	Length of Bond, Inches.	Length of Cross Connecting Bond, Inches.	Size of Rivet, Inches.	Price per Hundred.
Pulmonic	3189	24	60	$\frac{1}{4}$	\$31 00	Pulverous	3674	30	60	$\frac{1}{4}$	\$35 00
Pulp	3190	24	60	$\frac{5}{16}$	31 50	Pulvil	3675	30	60	$\frac{5}{16}$	35 50
Pulpatoon	3191	24	60	$\frac{3}{8}$	32 00	Puma	3677	30	60	$\frac{3}{8}$	36 00

CHANNEL PIN,  
FOR RAIL BONDING.

Trade Word.	List No.		Price.
Pulpit	3192	$\frac{11}{32}$ ds for No. 4 B. & S. wire	per 1000 \$15 00
Pulpous	3193	$\frac{9}{16}$ ths " 0 " "	" " 20 00



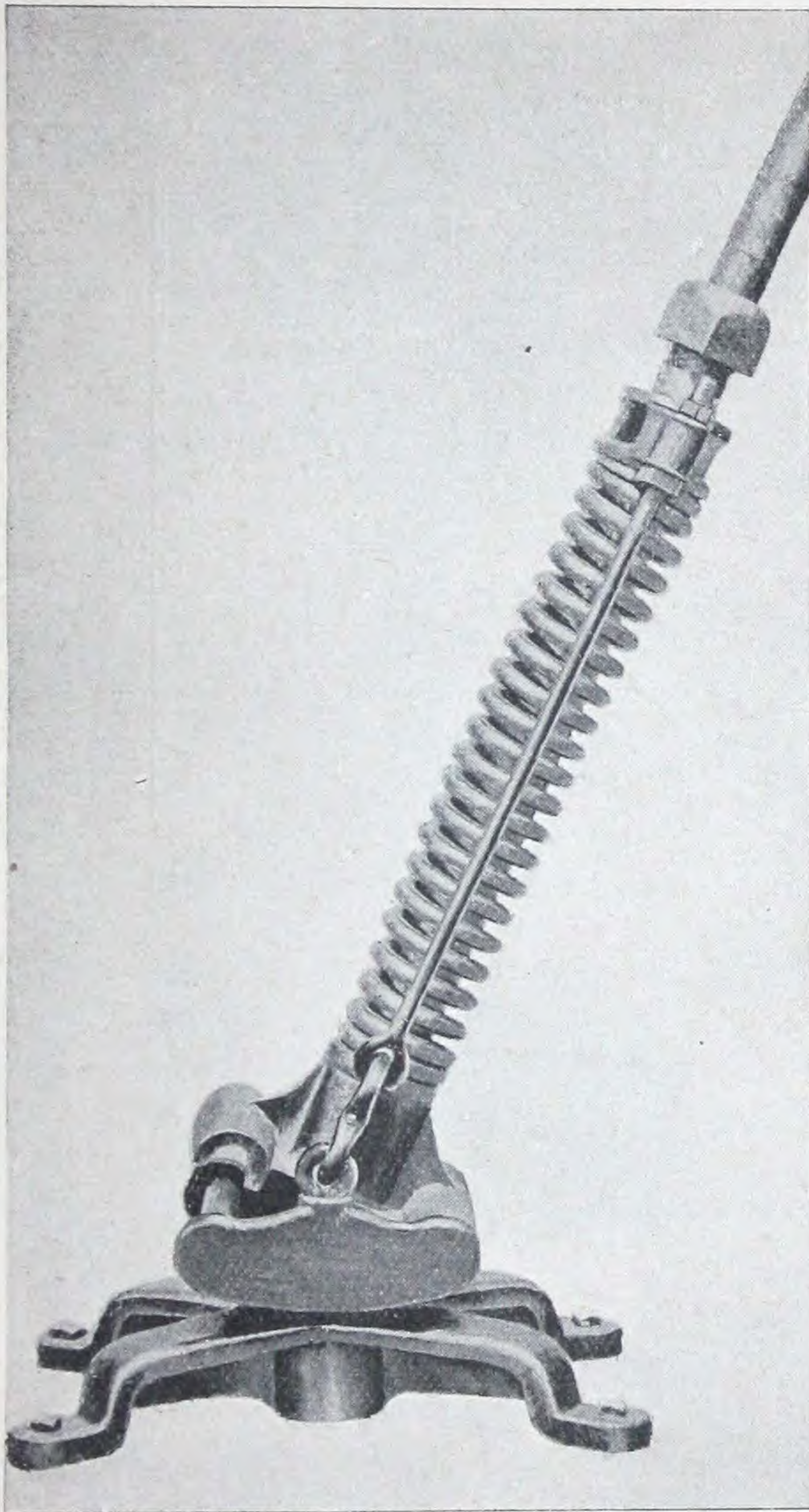
RAIL BOND CAP.

These bushings or caps are made of steel closed at the bottom end, with a slot running part way through the wall and the entire length of the cap. When the bushing is put on the wire and driven in the hole the slot in the cap closes tightly, forming a burr on the inside which holds the copper wire firmly in position, making practically one piece of the rail, bushing and wire. With the use of this cap a waterproof joint is secured, making a perfect electrical contact on all sides of the wire.

Trade Word.	List No.		Price.
Pulsate	3194	$\frac{11}{32}$ ds for No. 4 B. & S. wire	per 1000 \$20 00
Pulsation	3195	$\frac{9}{16}$ ths " 0 " "	" " 30 00



## THE GIBBS TROLLEY.



THIS FORM OF TROLLEY is intended to meet every requirement to which such an auxiliary of street railway traffic may be subjected, and testimonials are numerous affirming the claims which the company makes for it. By reference to the illustration, it may be seen that the trolley is constructed with special attention having been paid to requirements of stability and convenience, and that in it are comprised the latest ideas in trolley construction. We are prepared to furnish this device complete or in separate parts.

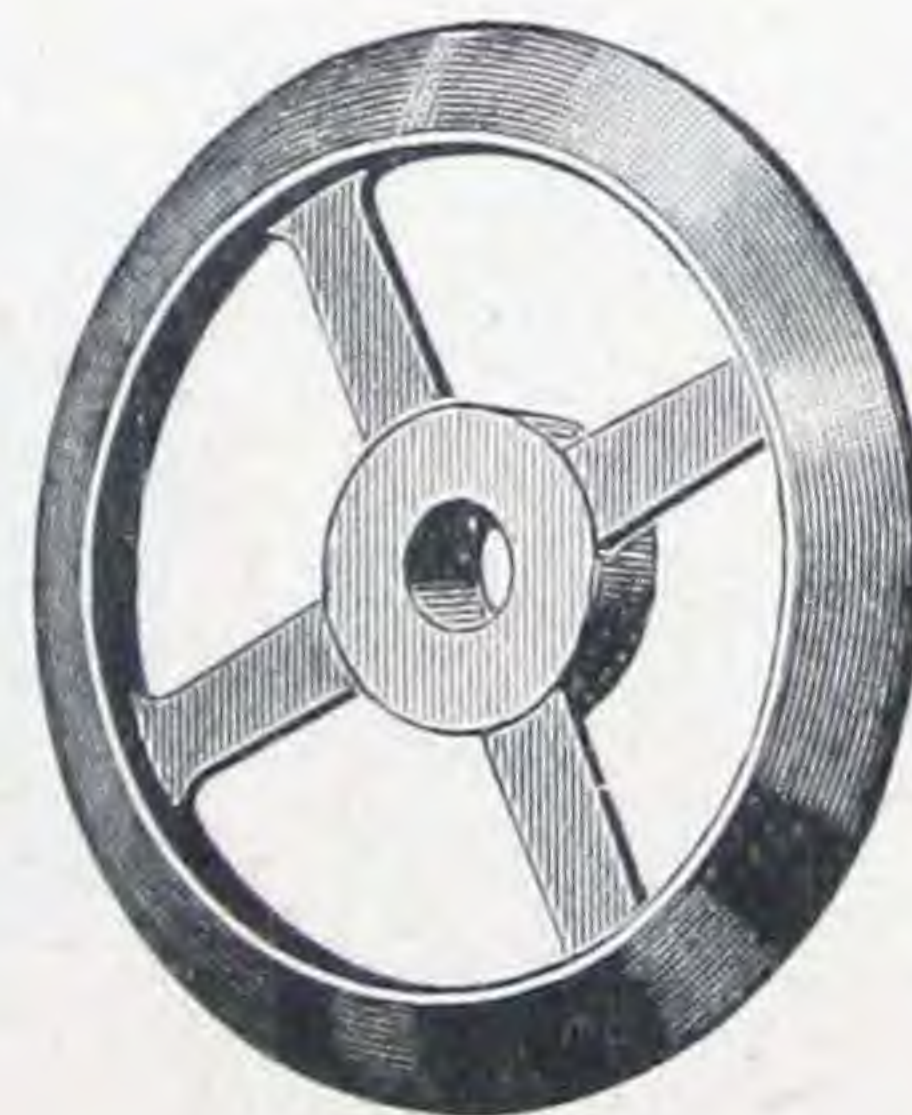
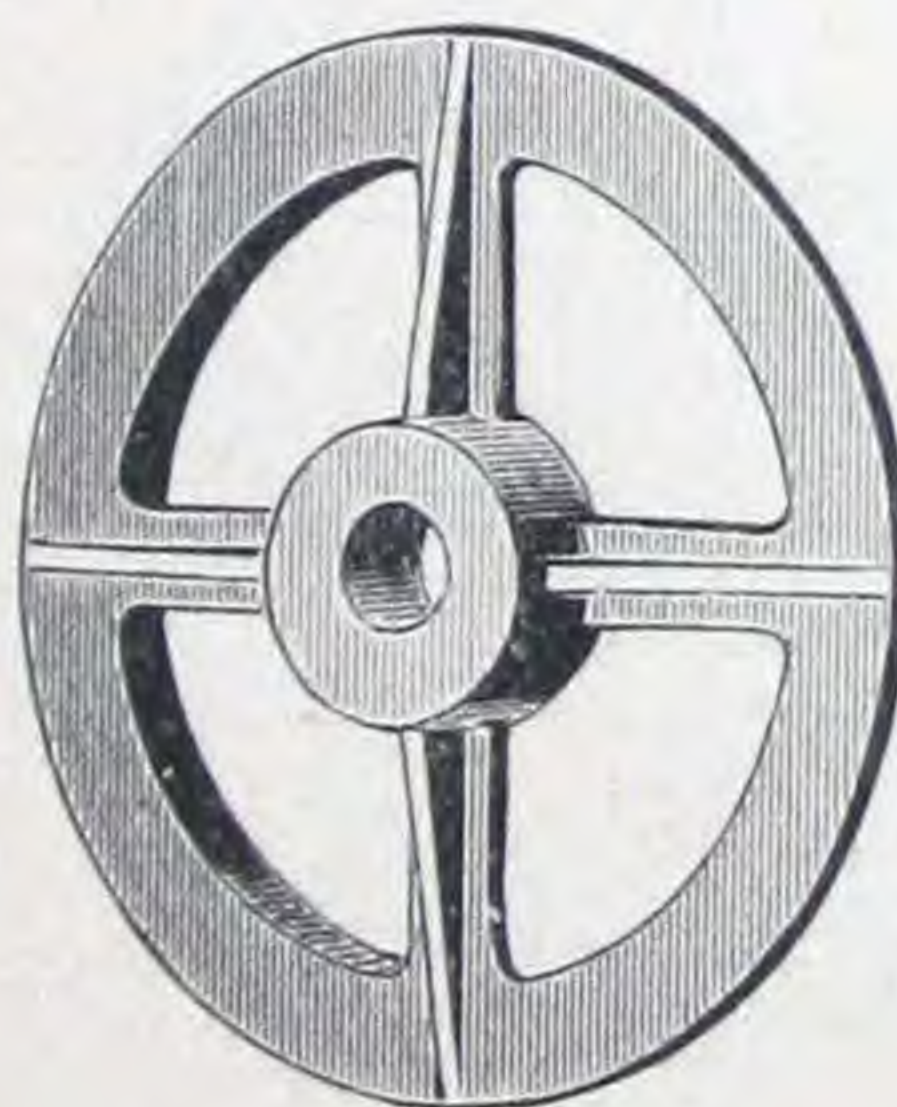
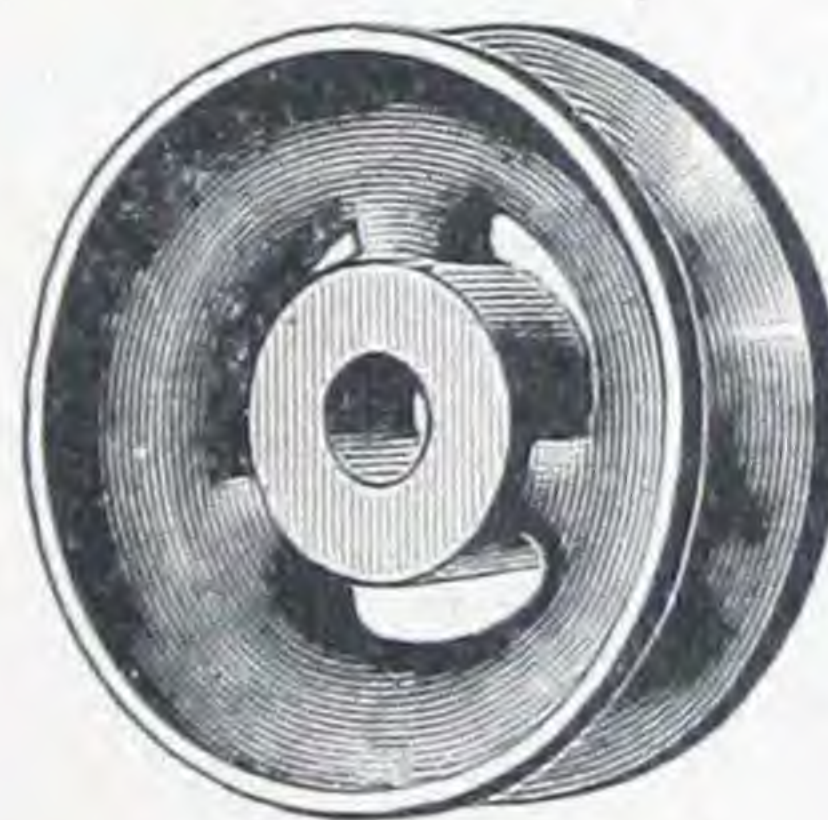
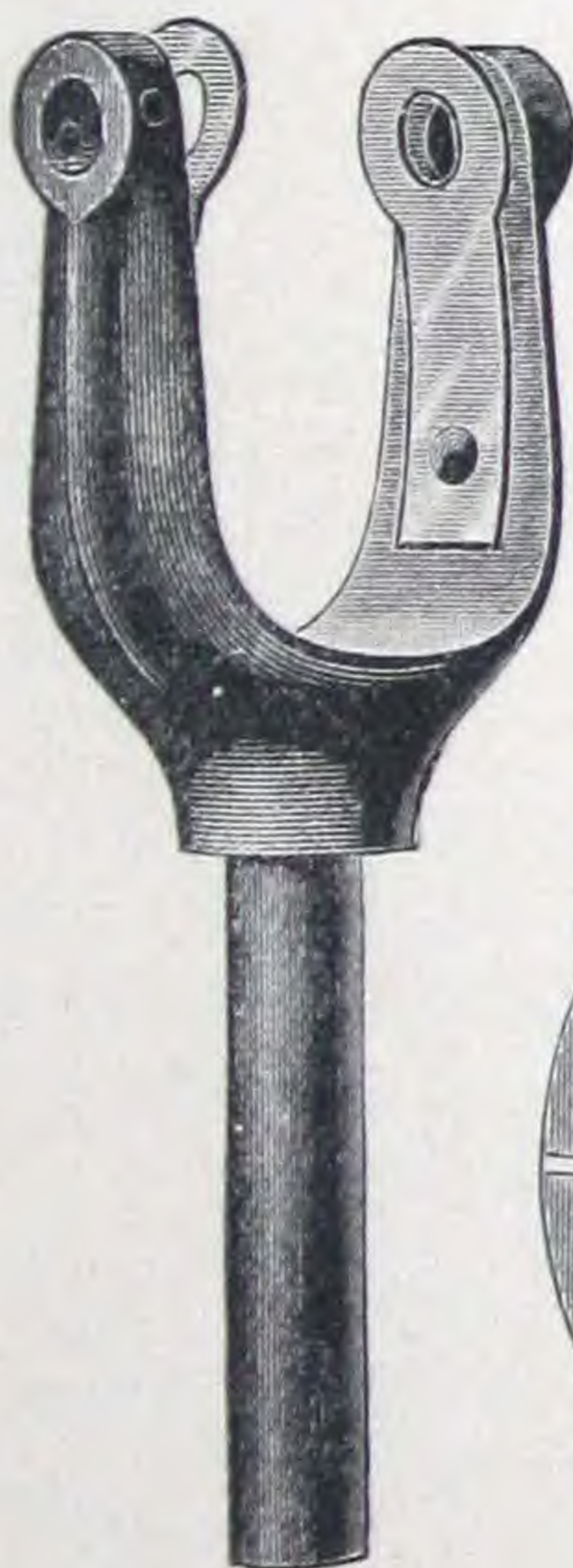
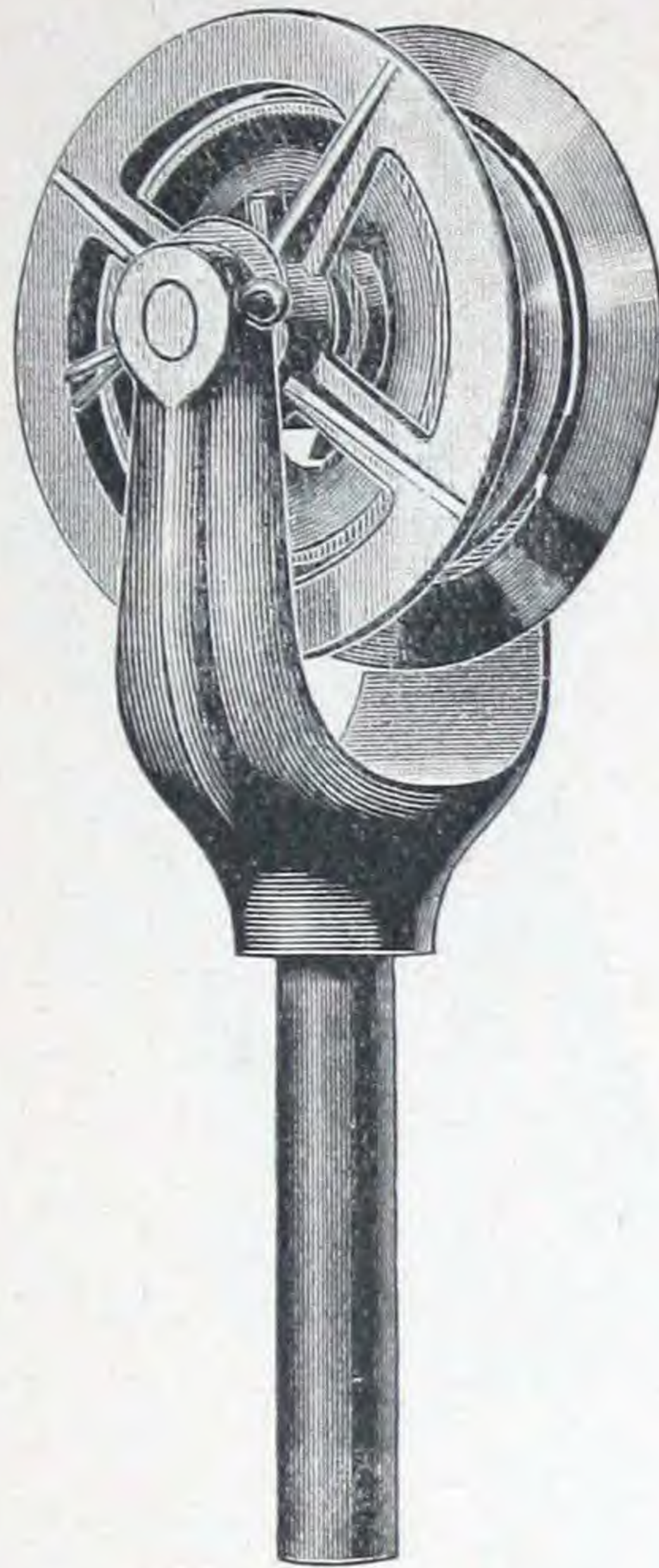


## THE GIBBS' TROLLEY PARTS.

Trade Word.	List No.			Price.
Pumicate	3196	Trolley complete steel pole .....	each	\$25 00
Pumicated	3197	“ base .....	“	17 50
Pumicating	3198	“ pole drawn steel harp and wheel .....	“	6 50
Pumice	3199	“ spring .....	“	1 88
Pumiceous	3200	“ stand .....	“	2 20
Pummel	3201	“ side rods each .....	“	1 25
Pump	3202	“ cross head .....	“	62
Pumper	3203	“ swivel .....	“	4 70
Pumpion	3204	“ rocker and socket .....	“	5 00
Pumpkin	3205	“ nut .....	“	62
Pumy	3206	“ pole drawn steel plain .....	“	3 75
Punch	3207	“ Steel harp, axle springs, contact springs and washers .....	each	1 61
Punched	3208	“ Bronze harp, axle springs, contact springs and washers .....	each	1 61
Punching	3209	Axle pins for Thomson-Houston system .....	“	20
Punchy	3210	“ “ “ Nuttal system .....	“	20
Punctate	3211	“ “ “ Gen. Electric Co. ....	“	20
Punctiform	3212	Contact springs T.-H. ....	per 100	6 00
Punctilio	3213	“ “ Nuttal .....	“ “	6 00
Punction	3214	“ “ Gen. Elec. ....	“ “	6 00
Puncto	3215	“ washers T.-H. ....	“ “	1 20
Punctual	3216	“ “ Nuttal .....	“ “	1 20
Punctuate	3217	“ “ Gen. Elec. ....	“ “	1 20
Punctuation	3218	Aluminum bronze wheels T.-H. ....	each	1 20
Punctuist	3219	“ “ “ Nuttal .....	“	1 20
Puncture	3220	“ “ “ Gen. Elec. ....	“	1 20
Pundit	3221	Graphite bushings for all wheels .....	“	20



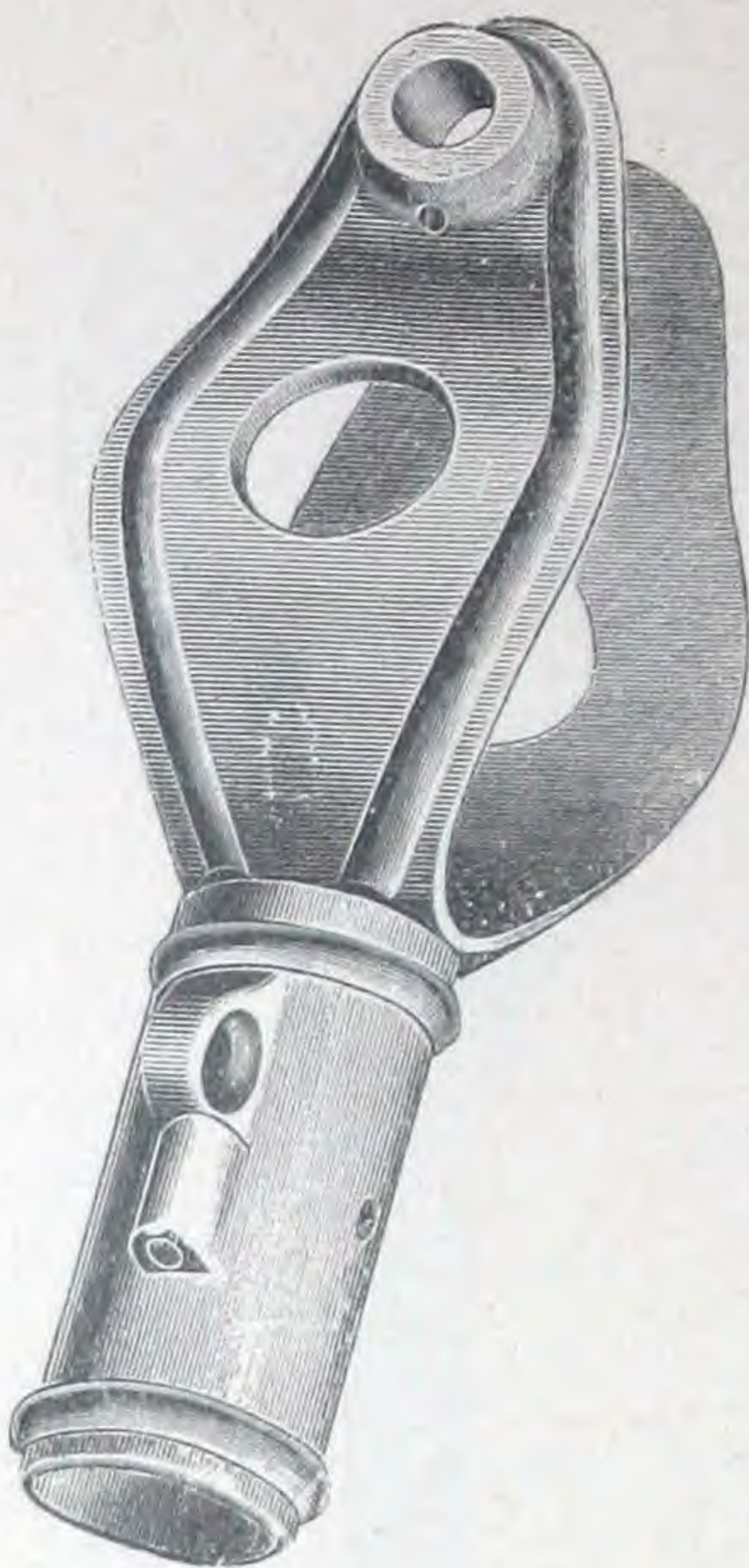
## TROLLEY WHEELS.



Trade Word.	List No.			Price.
Pungency	3678	Trolley, complete.....	each	\$5 00
Pungent	3679	Independent Contact Ring.....	"	1 50



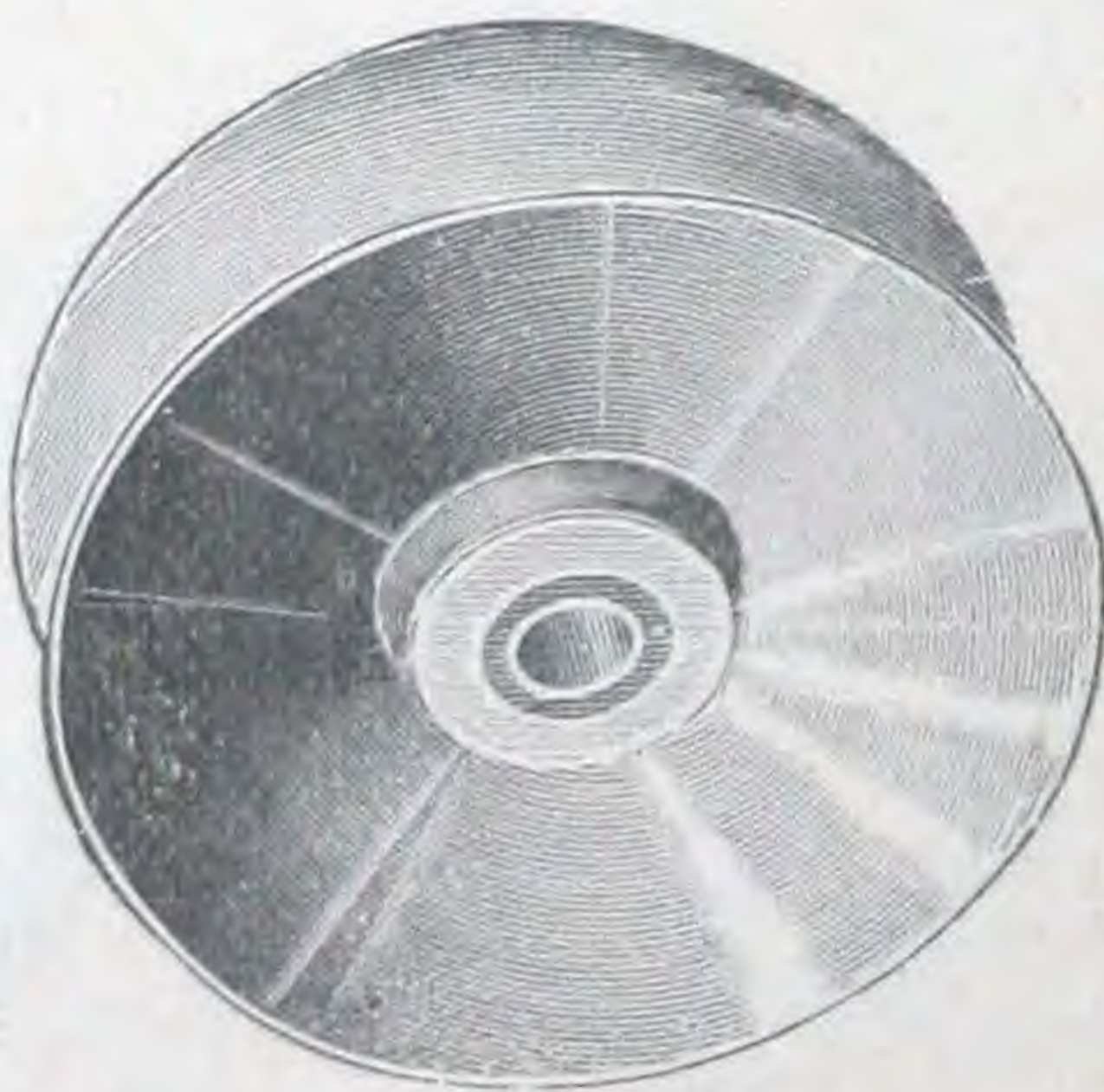
TROLLEY HARP.



Made of bronze metal and is strong, light and durable.  
For use on wooden trolley poles.

Trade Word.	List No.		Price.
Punic	3307	With Steel Axle Pin .....	each \$2 50

TROLLEY WHEEL.

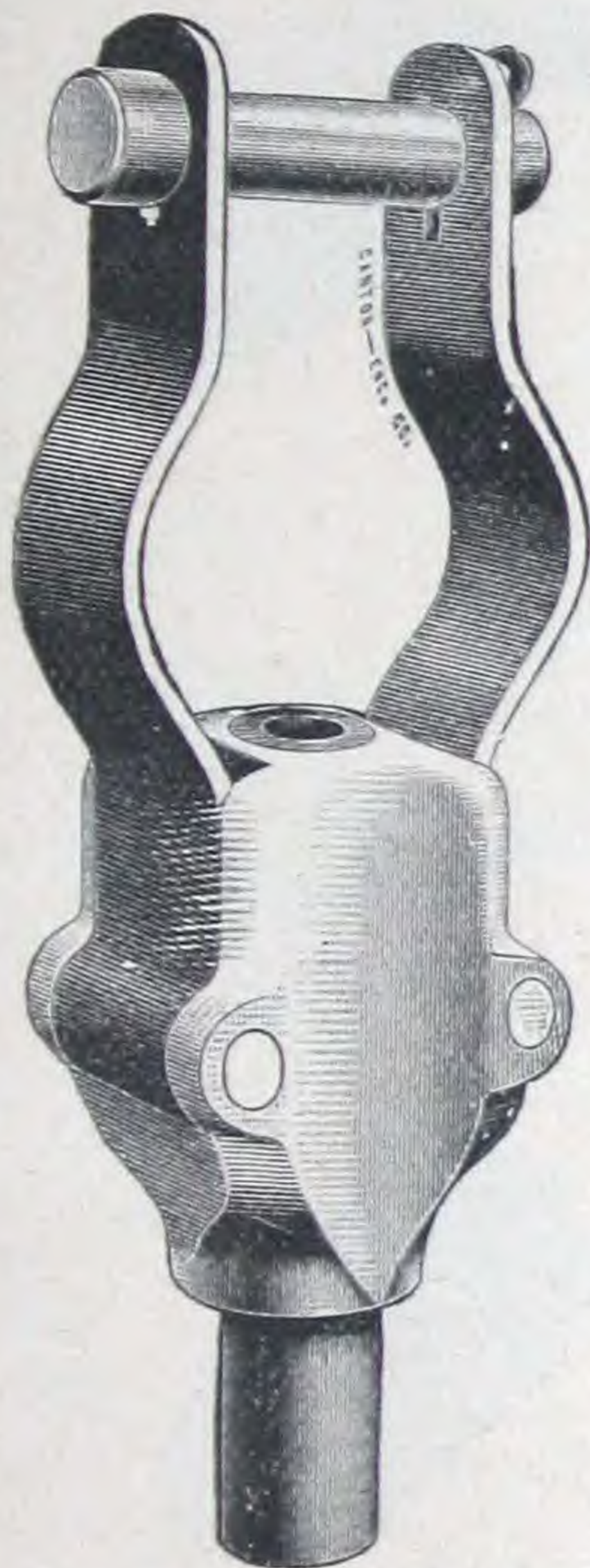


Phosphore bronze with graphite bushings.

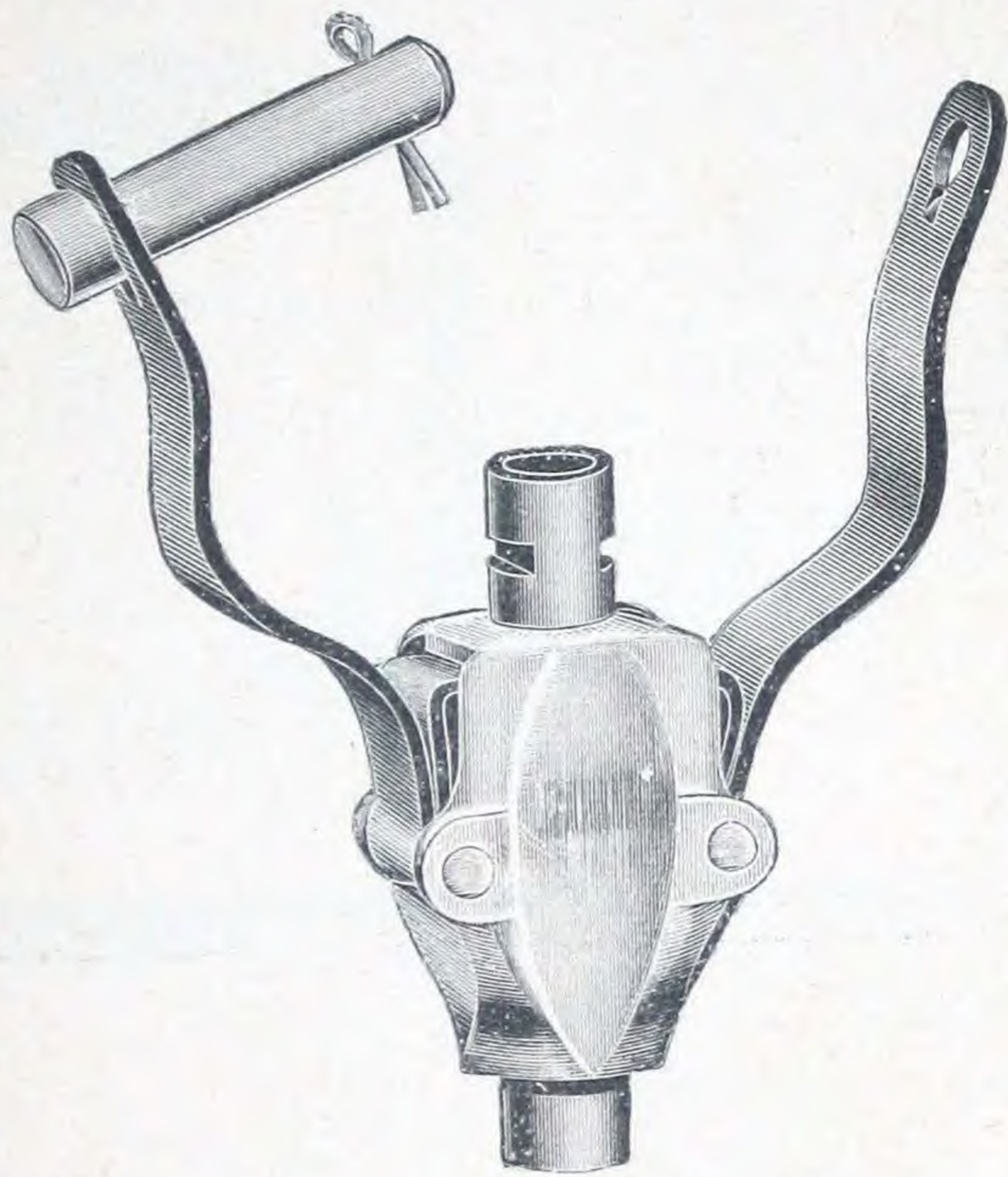
Trade Word.	List No.		Price.
Puninness	3308	T.-H. Type .....	each \$1 90
Punish	3309	Westinghouse .....	" 2 00
Punishable	3310	" heavy .....	" 2 10



## SELF-LOCKING TROLLEY HARP.



Locked.



Unlocked.

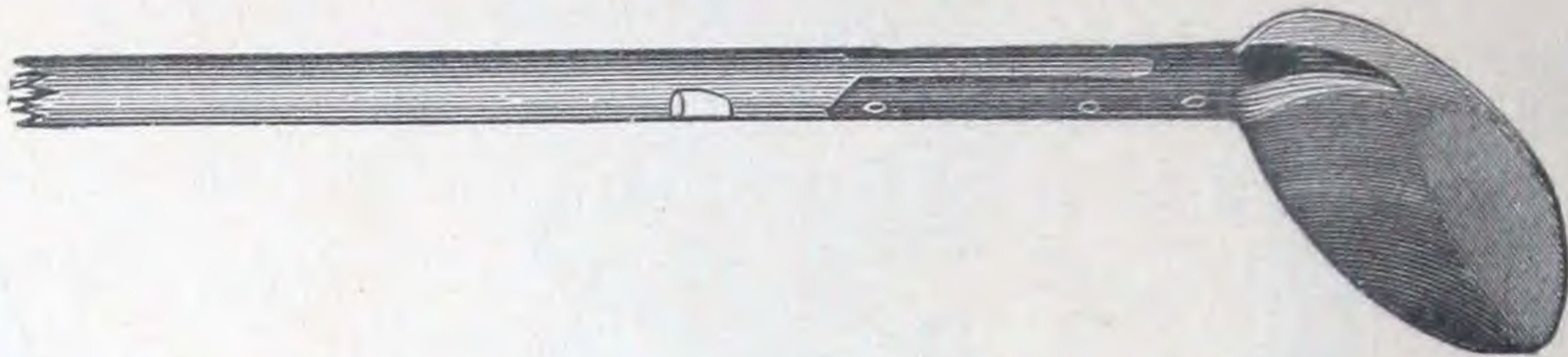
This harp is made of steel, and weighs about 16 ounces. By removing the spindle from the trolley wheel, the harp is unjointed and can be removed from the pole. In ordering, specify outside diameter of trolley pole top. A special socket is furnished for wooden pole.

Trade Word.	List No.		Price.
Punished	3067	Complete, with steel axle pin	each \$2 00



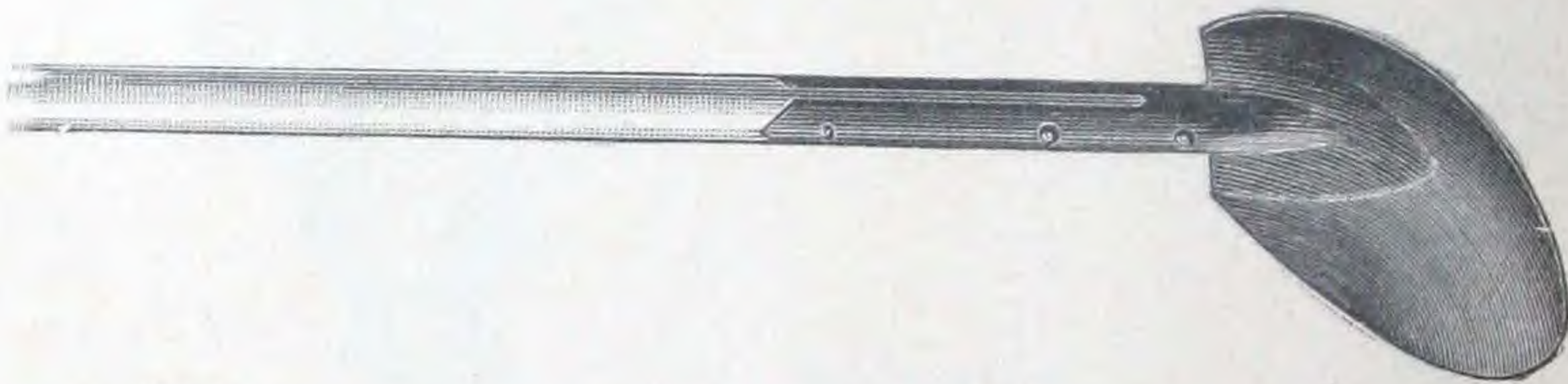
CONSTRUCTION TOOLS.

SPOONS.



Trade Word.	List No.					Price.
Punisher	1571	Regular 7 foot handle	-----	each		\$1 00
Punishing	1572	" 8 " "	-----	"		1 25
Punishment	1573	Heavy 7 " "	-----	"		1 25
Punition	1574	" 8 " "	-----	"		1 50

SHOVELS.



Trade Word.	List No.					Price.
Punitive	1581	Regular 7 foot handle	-----	each		\$1 00
Punitory	1575	" 8 " "	-----	"		1 25
Punk	1576	Heavy extra long straps, 7 foot handle	-----	"		1 50
Punka	1577	" " " " 8 " "	-----	"		2 00

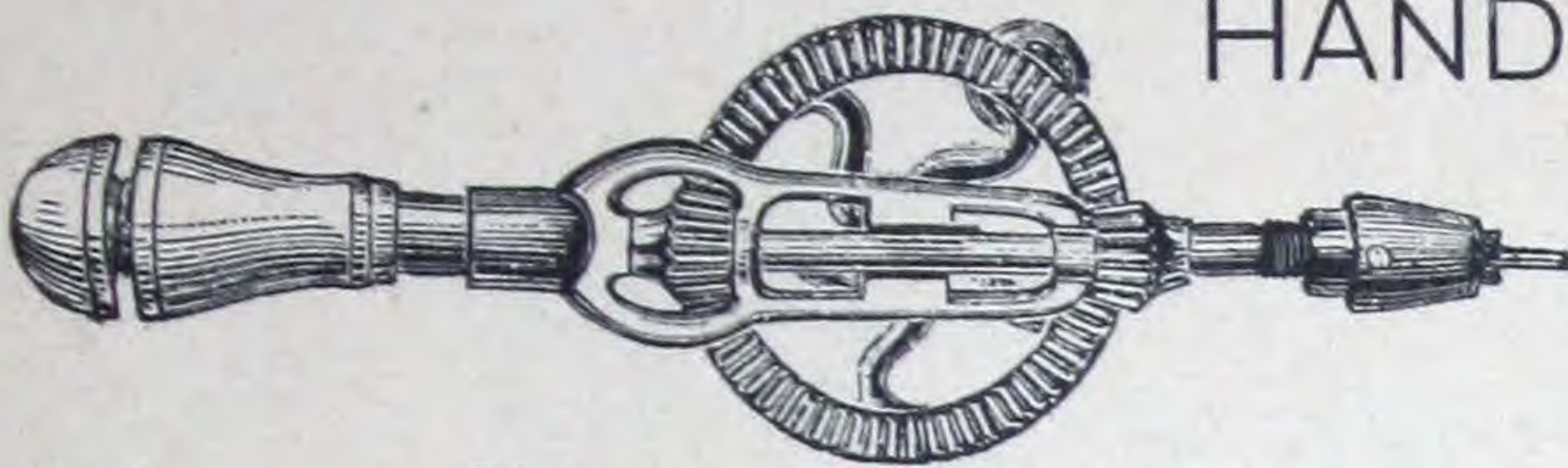
EUREKA POST HOLE DIGGER.



Trade Word.	List No.					Price.
Punner	1578	-----		each		\$3 00

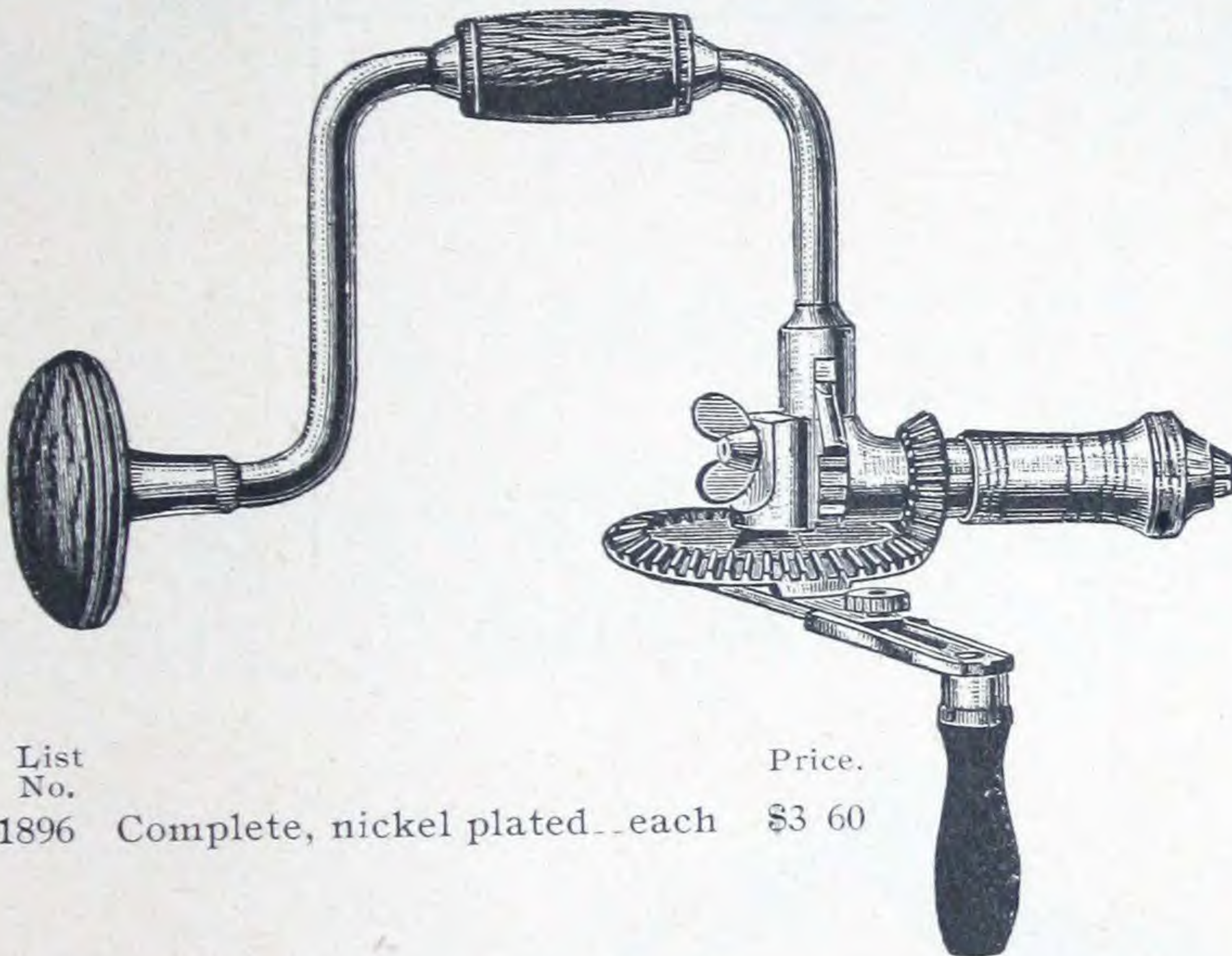


## HAND DRILL.



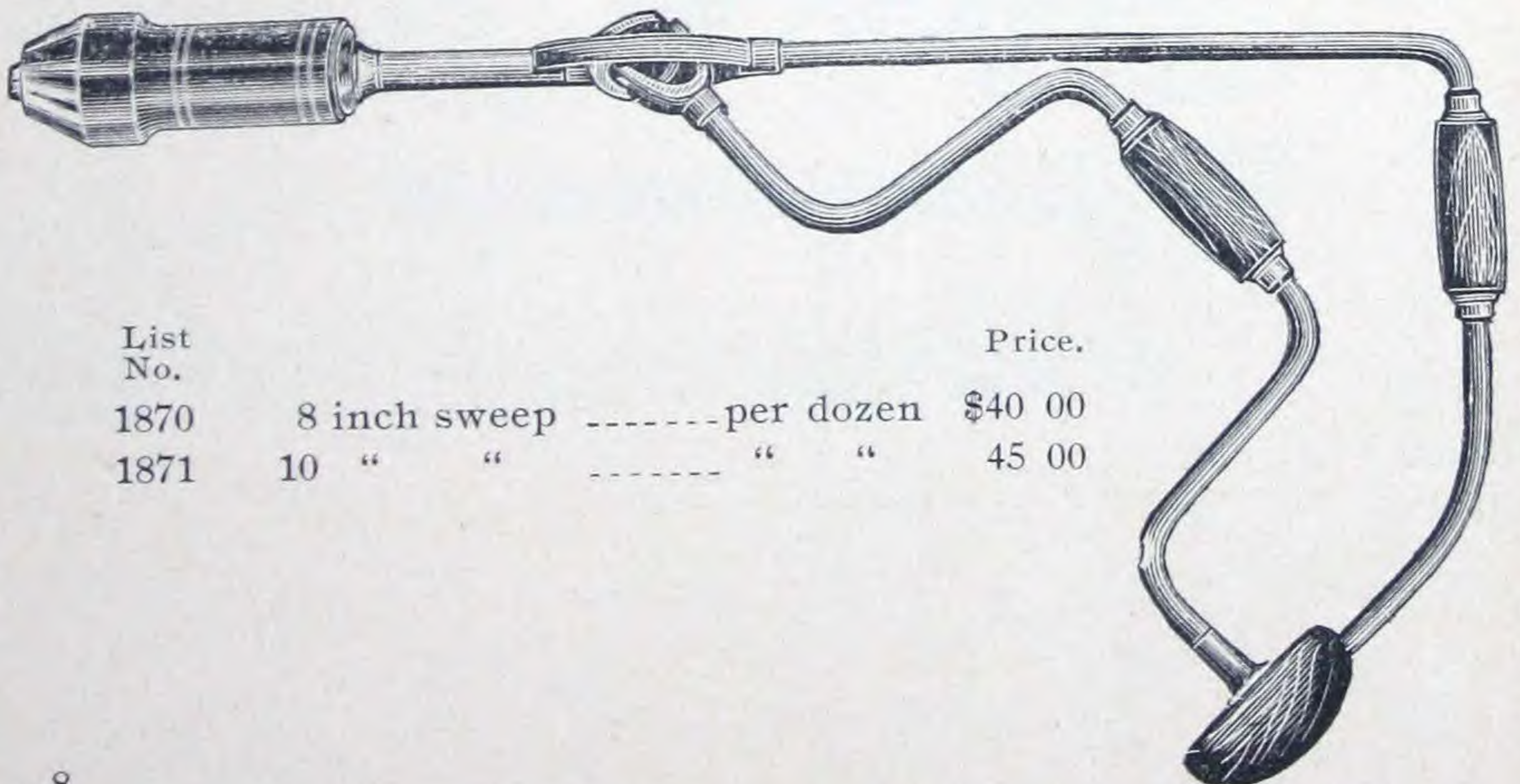
Trade Word.	List No.		Price.
Punster	1895	Provided with hollow handle to hold drills, single gear, with six drills and nickel drill chuck....each	\$1 50

## DRILL BRACE.



Trade Word.	List No.		Price.
Punter	1896	Complete, nickel plated...each	\$3 60

## AMIDON'S PATENT CORNER BRACE.



Trade Word.	List No.		Price.
Puny	1870	8 inch sweep -----per dozen	\$40 00
Pupil	1871	10 " " -----" "	45 00

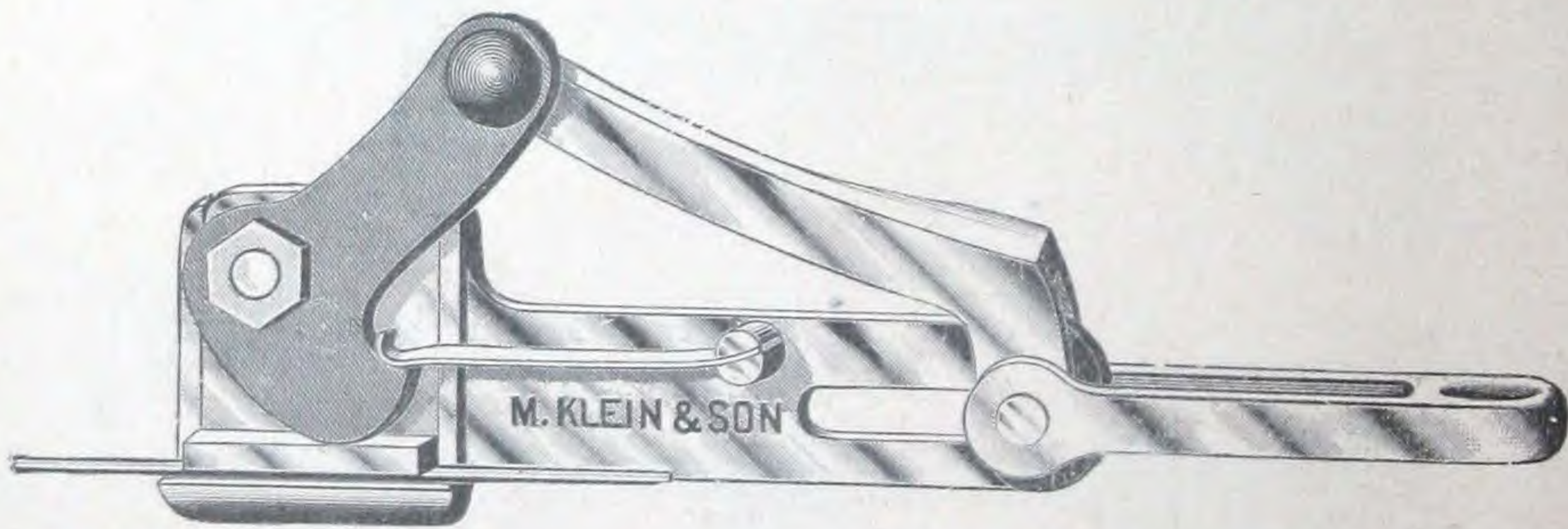


KLEIN'S PLAIN ECCENTRIC.



Trade Word.	List No.			Price.
Radiant	1611	Brass	..... each	\$1 50
Radiary	1612	Steel	..... "	1 20
Radiata	1613	Eccentric strap	..... "	70

KLEIN'S COMPOUND ECCENTRIC.

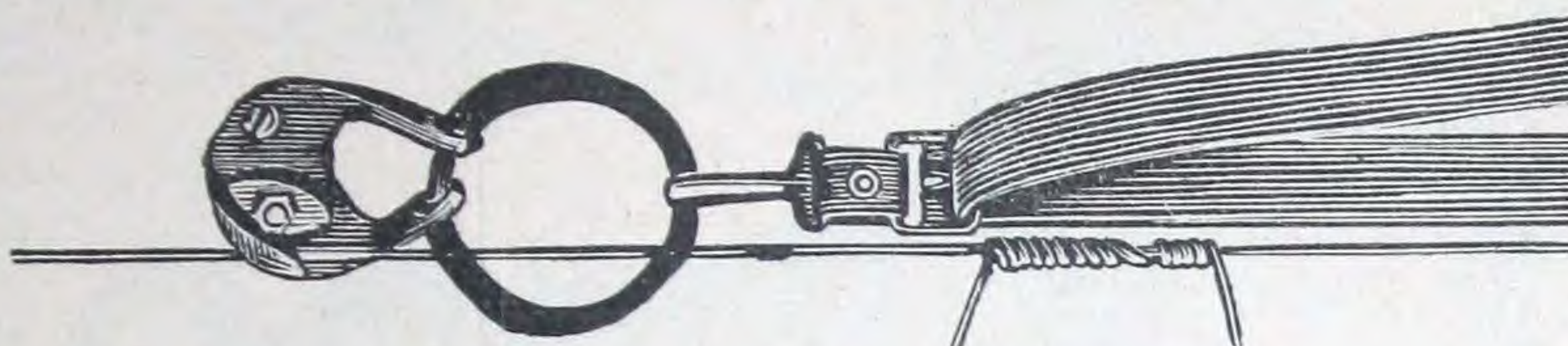


For hard drawn copper wire As both the upper and lower bearings of this clamp are made of brass there is no danger of injuring the wire. It has been thoroughly tested, and we guarantee it to do the work it is intended for.

Trade Word.	List No.			Price.
Radiate	1614	.....	each	\$2 25



## COME-ALONG ECCENTRICS.



Trade Word.	List No.		Price.
Raddle	1616	Come-along No. 4 extra heavy ----- each	\$1 75
Raddock	1617	“ “ “ 3 ----- “	75

## TIE WRENCH.



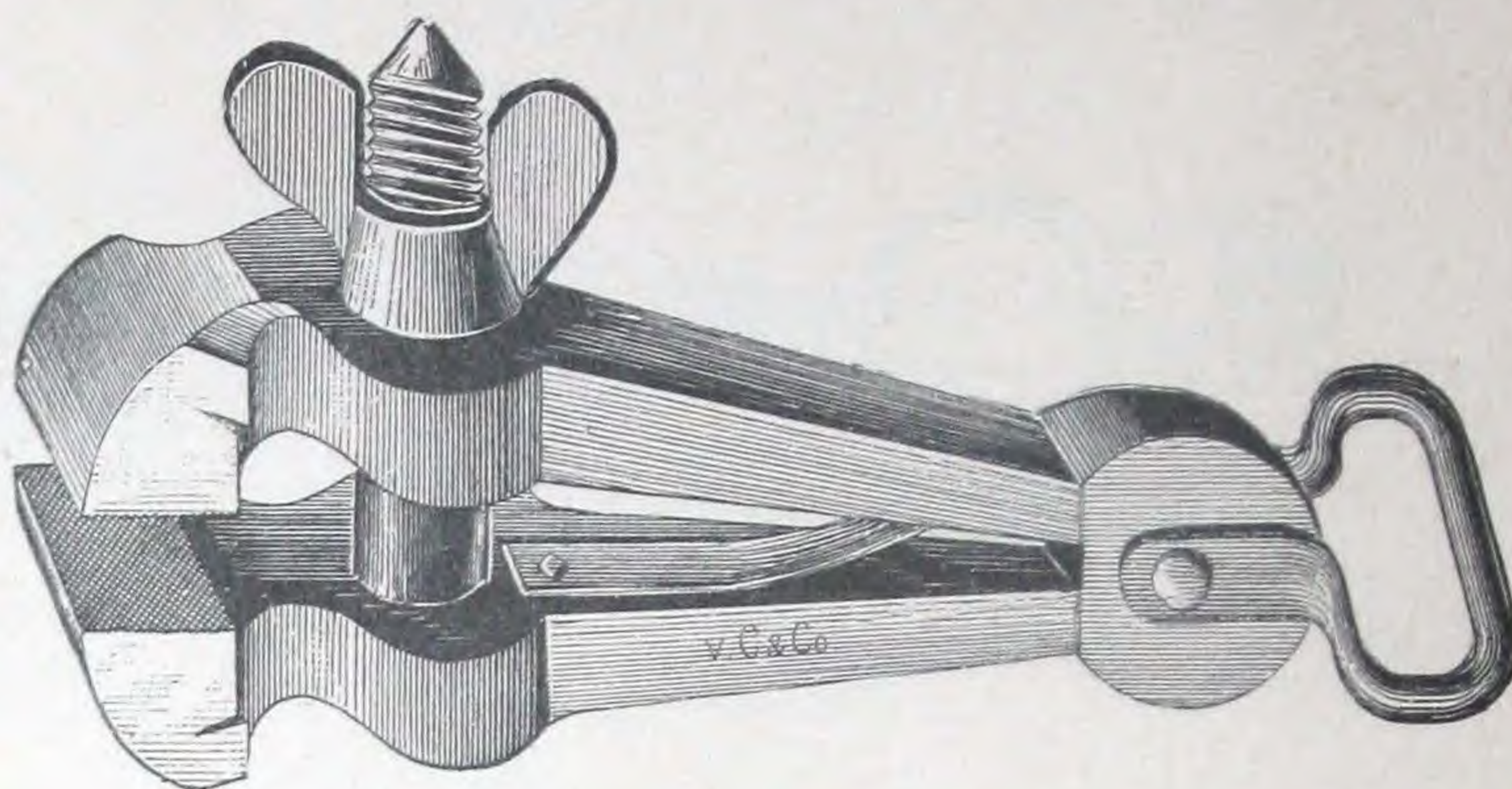
Trade Word.	List No.		Price.
Radial	1618	Copper wire tie wrenches ----- each	\$1 25

DISSTON'S IMPROVED PRUNING SAW  
AND KNIFE.

Trade Word.	List No.		Price.
Radiance	1638	----- each	\$1 25

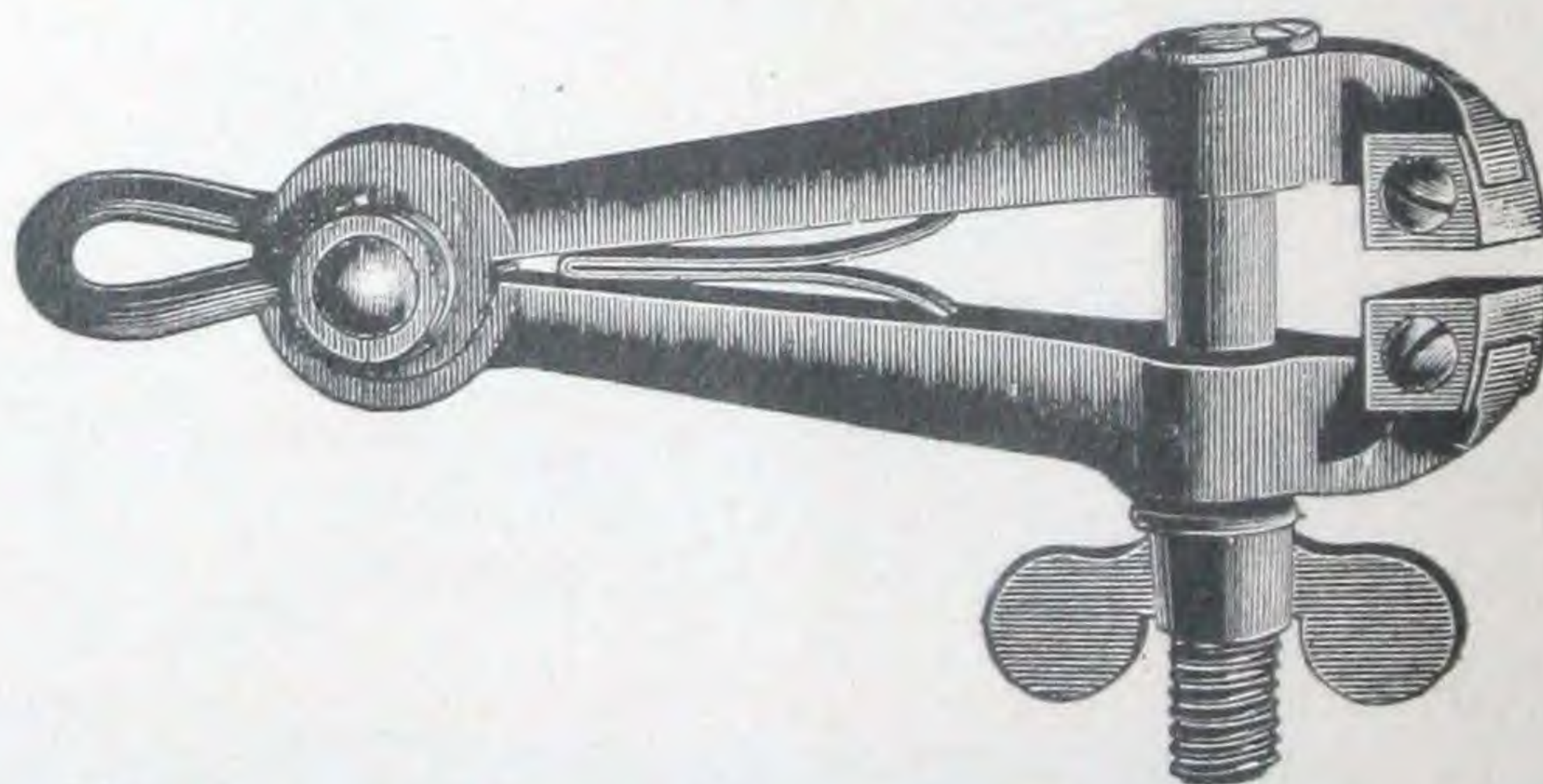


## STUB'S LINEMENS VISES.



Trade Word.	List No.			Price.
Rabid	1625	5½ inch without loop	each	\$2 50
Rabinet	1626	5½ " with loop	"	3 00
Raccoon	1627	Vice straps extra	"	85

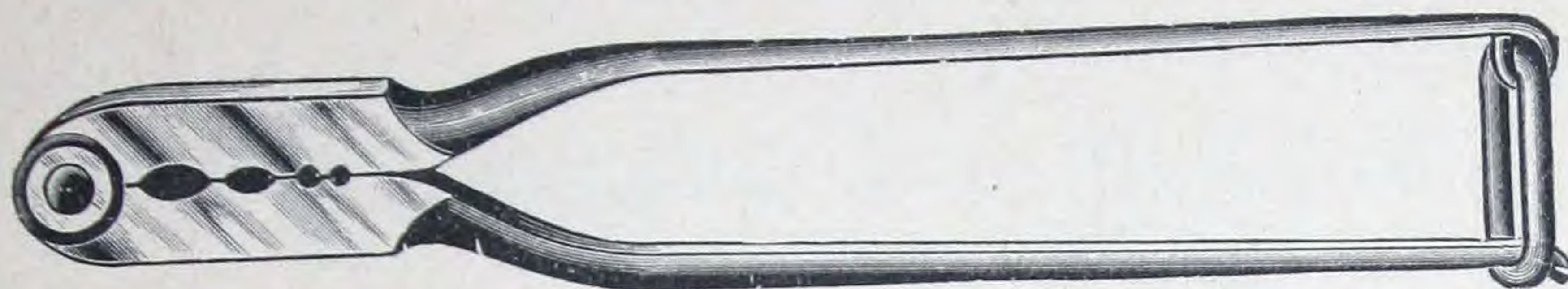
## HALL'S LINEMENS VISES.



Trade Word.	List No.			Price
Raceme	1628	5 inch without loop	each	\$2 25
Race	1629	5 " with "	"	2 50
Racer	1630	6 " without "	"	3 00
Rachis	1631	6 " with "	"	3 25
Rack	1632	Vice straps extra	"	85
Racket	1633	Extra jaws	"	25
Racking	1634	" thumb nuts	"	20
Racy	1635	" rings	"	25
Rad	1636	" springs	"	25



## SPLICING CLAMPS OR CONNECTORS.



Trade Word.	List No.		Price.
Rafting	1694	..... each	2 00



Trade Word.	List No.		Price.
Rag	1695	..... each	\$2 00



Trade Word.	List No.		Price.
Rage	1696	..... each	\$2 00



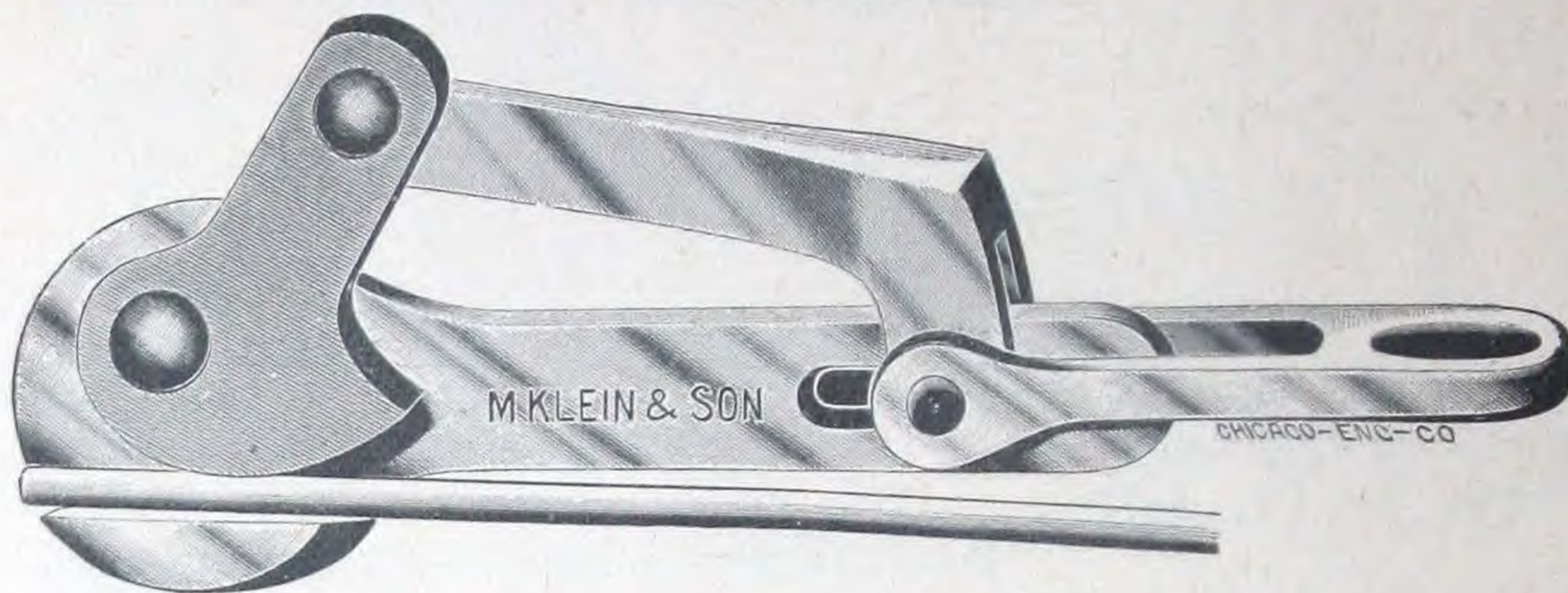
Trade Word.	List No.		Price.
Ragged	1697	Copper jawed ..... each	\$3 50



Trade Word.	List No.		Price.
Ragout	1698	Splicing wrench ..... each	\$1 25

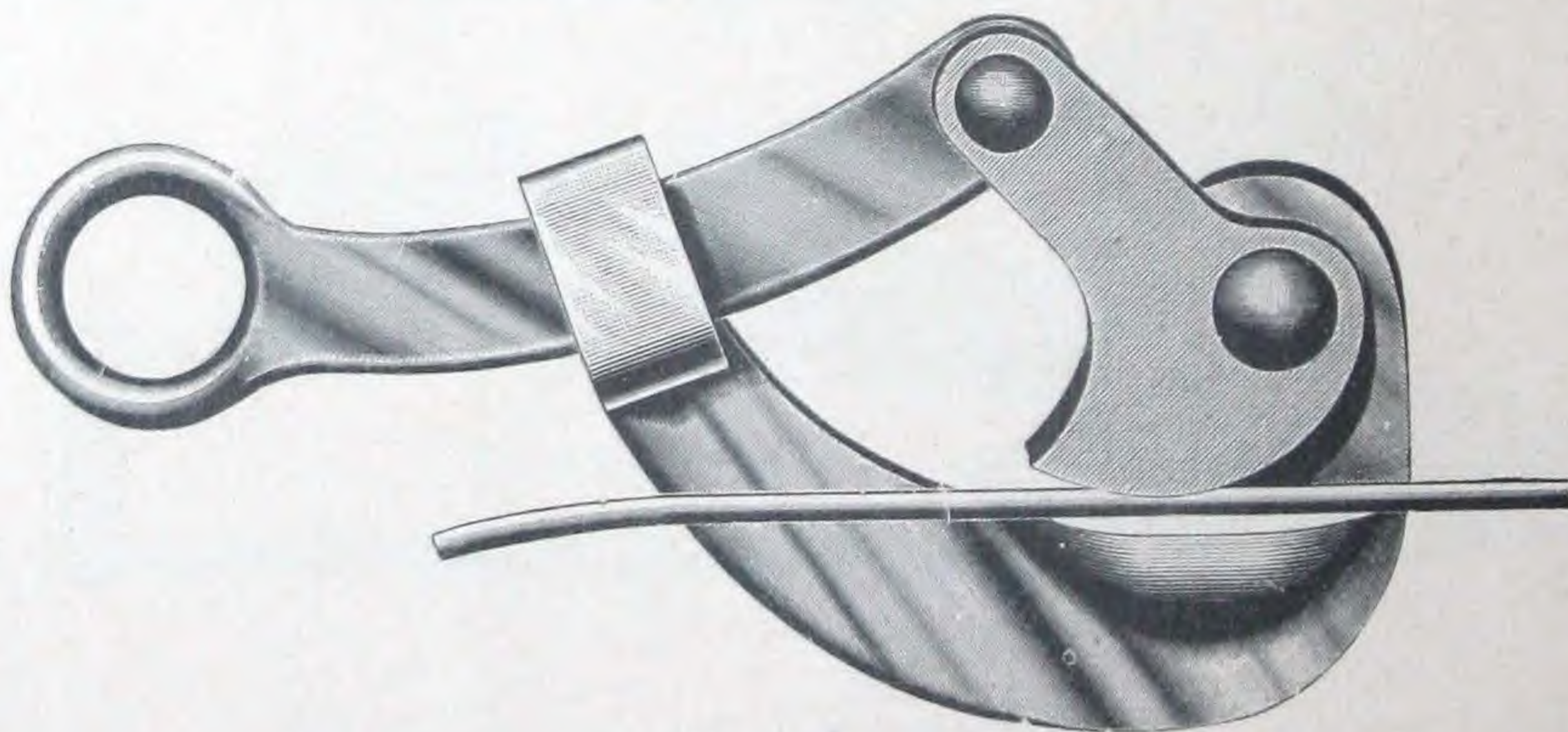


## KLEIN'S COMPOUND ECCENTRIC CLAMP.



Trade Word.	List No.		Price.
Radiating	1608	Klein's compound eccentric clamp ----- each	\$1 75

## HAVEN'S CLAMP.

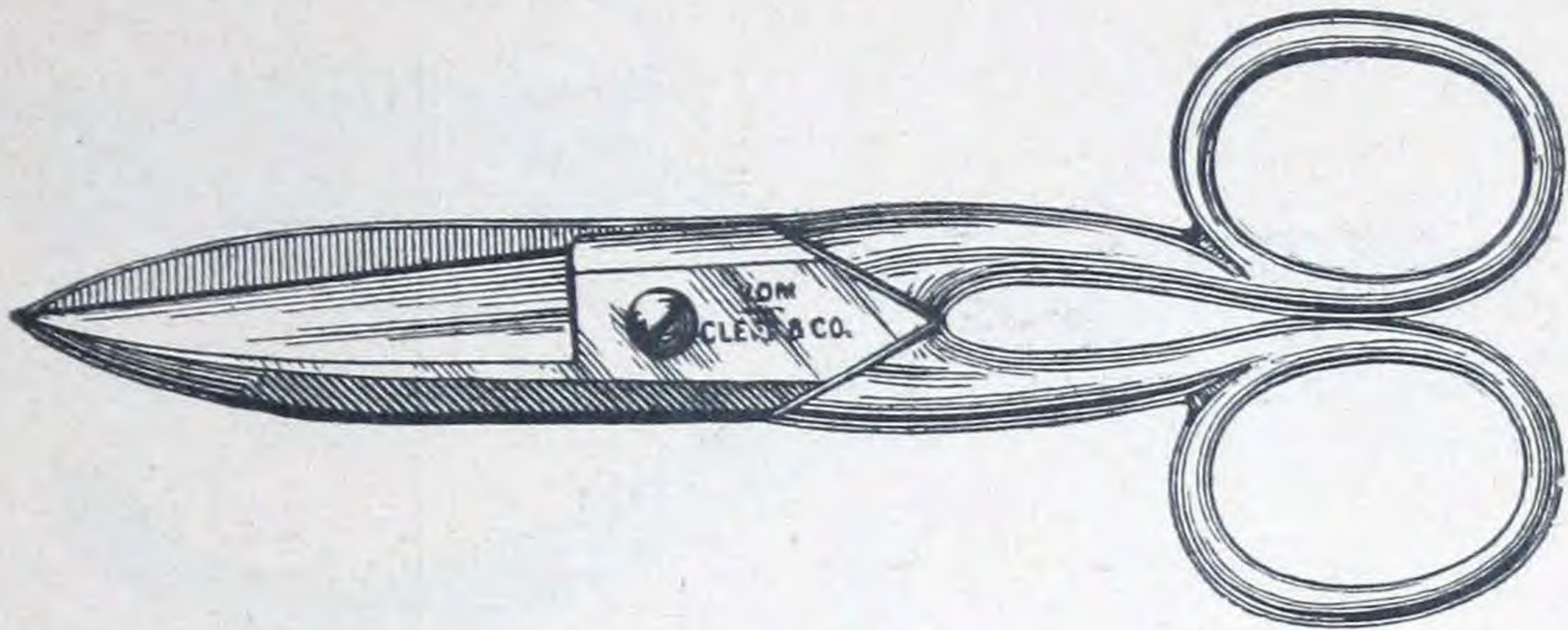


Two Sizes.

Trade Word.	List No.		Price.
Radiation	1609	Small size ----- each	\$2 00
Radical	1610	Large " ----- "	3 75

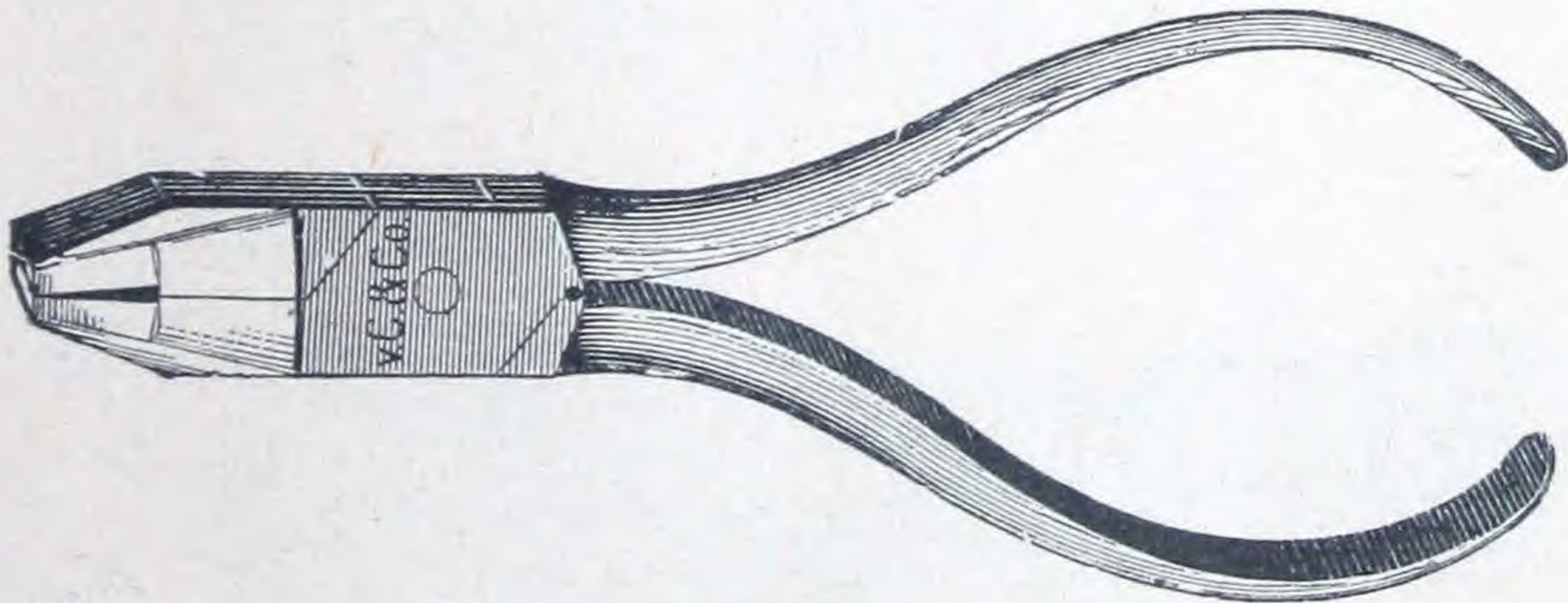


ELECTRICIAN'S SCISSORS.



Trade Word.	List No.		Price.
Pureness	1752	Full length $5\frac{1}{4}$ inches, length of blade $1\frac{7}{8}$ inches, each	\$1 25

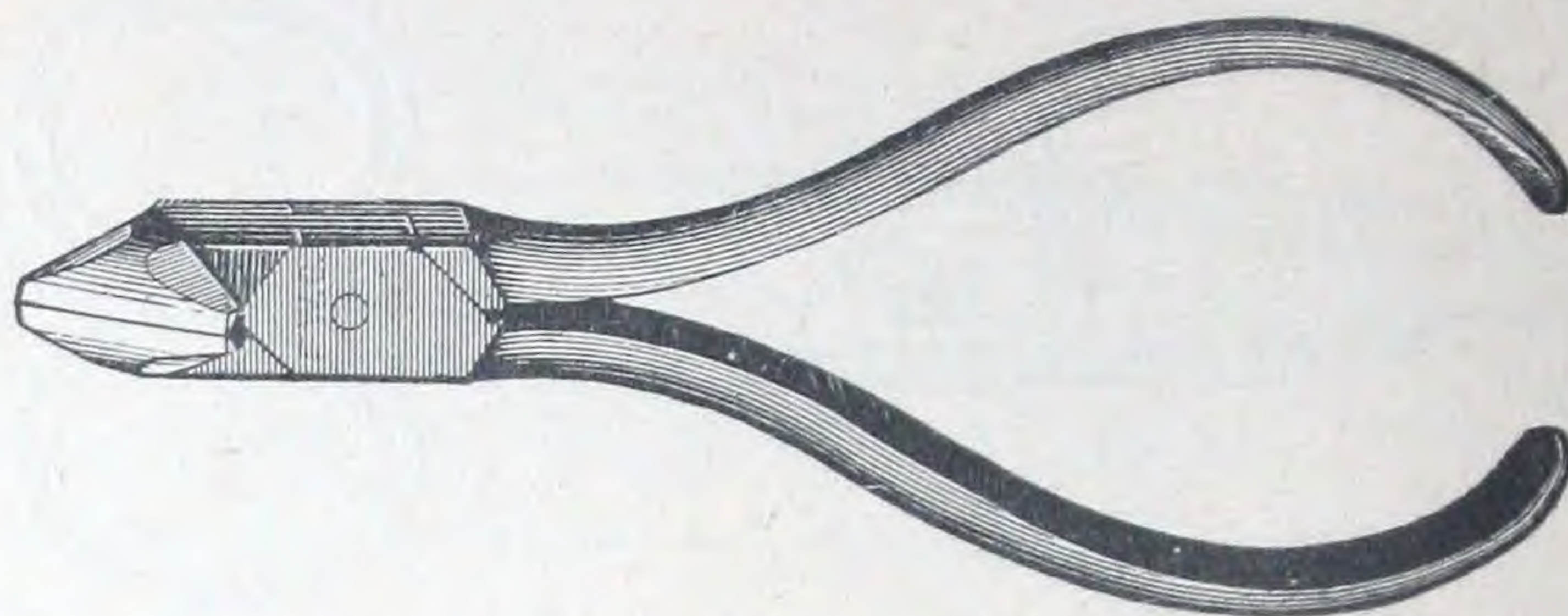
SIDE-CUTTING PLIERS.



Trade Word.	List No.		Size Inches.	Plain per Pair.	Nickel Plated per Pair.
Purfile	1753	----- each	$4\frac{1}{2}$	\$0 85	\$1 35
Purgament	1754	----- "	5	85	1 40
Purgative	1755	----- "	6	90	1 50
Purgatory	1756	----- "	7	1 50	2 00
Purge	1757	----- "	8	2 00	2 50

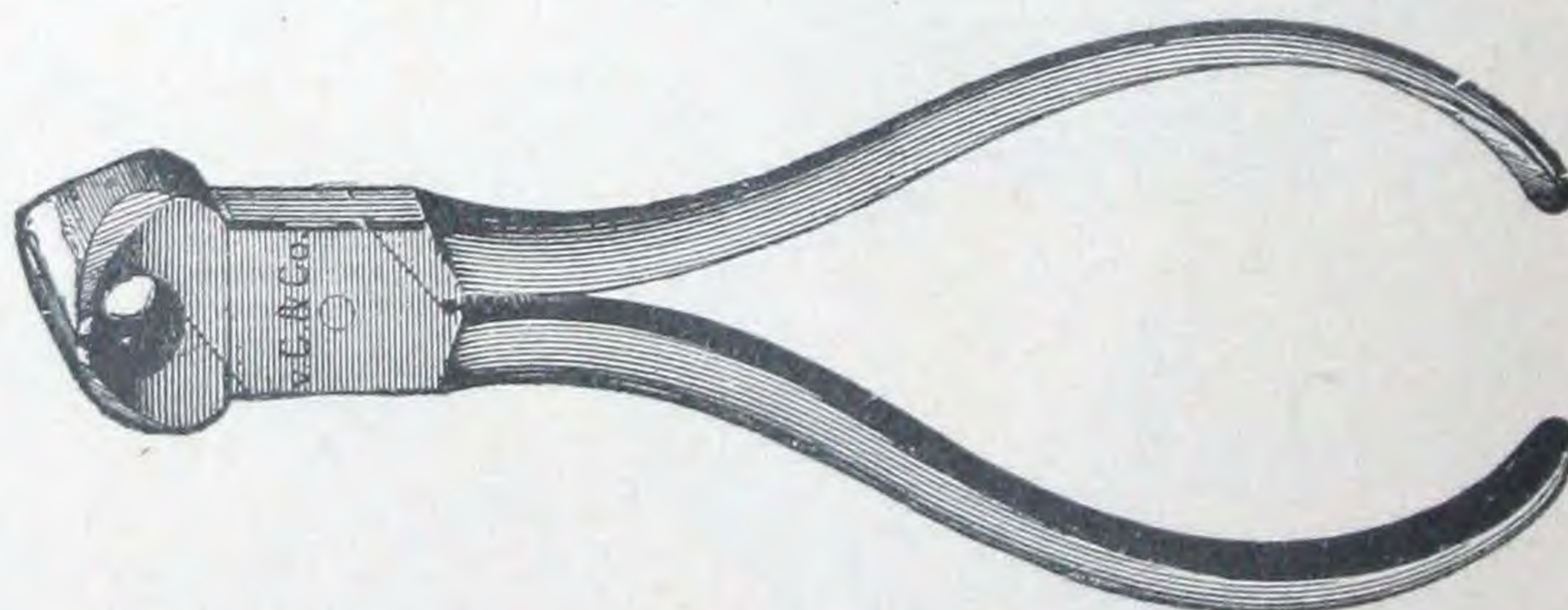


## DIAGONAL PLIERS.



Trade Word.	List No.		Size Inches.	Plain per Pair.	Nickel Plated per Pair.
Purging	1758	-----each	4	\$0 80	\$1 30
Purifier	1759	-----"	5	90	1 40
Purist	1760	-----"	6	1 00	1 50

## END-CUTTING NIPPERS.



Trade Word.	List No.		Price.
Puritan	1761	5 inch. plain-----each	\$0 75
Puritanic	1762	6 " "-----"	1 25
Puritanical	1763	5 " nickel plated-----"	1 25
Puritanism	1764	6 " " "-----"	1 75

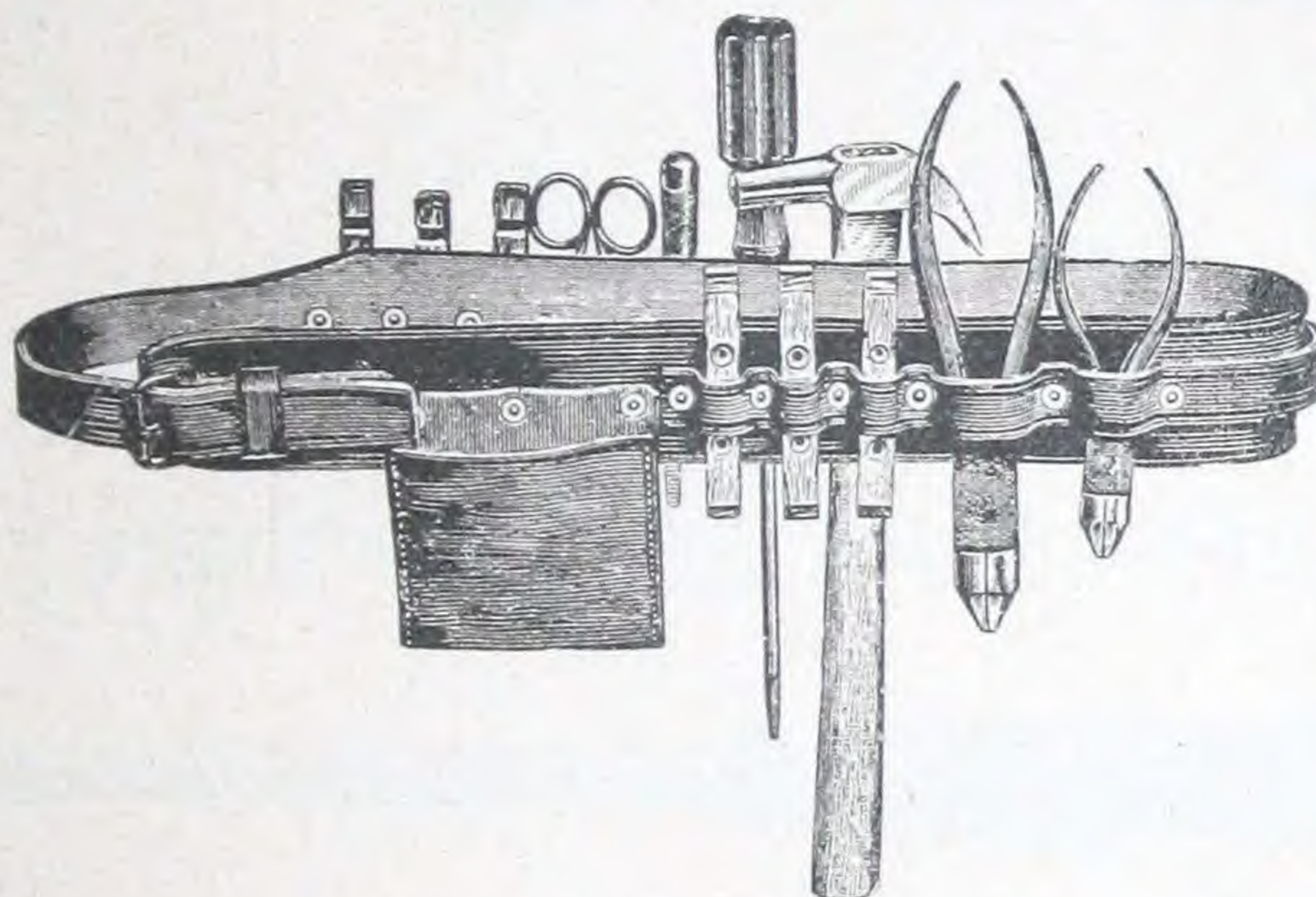




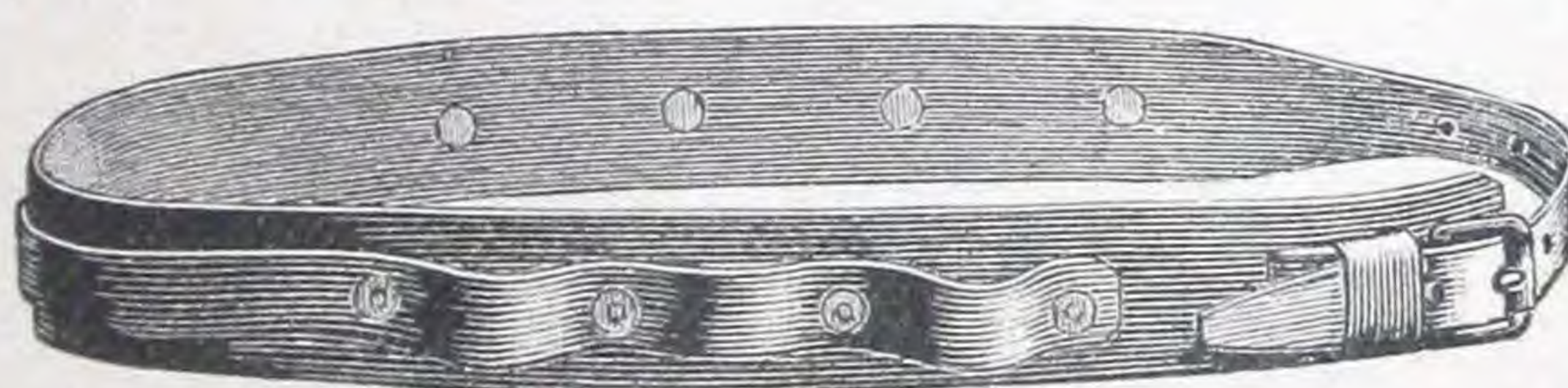
## LINEMEN'S TOOL BAG.

Trade Word.	List No.	Price.
Puritanize	1742	Canvas with handles each \$5 00

## WIREMEN'S TOOL BELTS.



Trade Word.	List No.	Price.
Purity	1743 Best leather	each \$1 00



Trade Word.	List No.	Price.
Purl	1744 Best leather	each \$1 00

## RUBBER GLOVES.

Sizes Nos. 10, 11 and 12 in stock. State size wanted when ordering. There is a difference of three numbers between the same size of rubber and kid gloves.



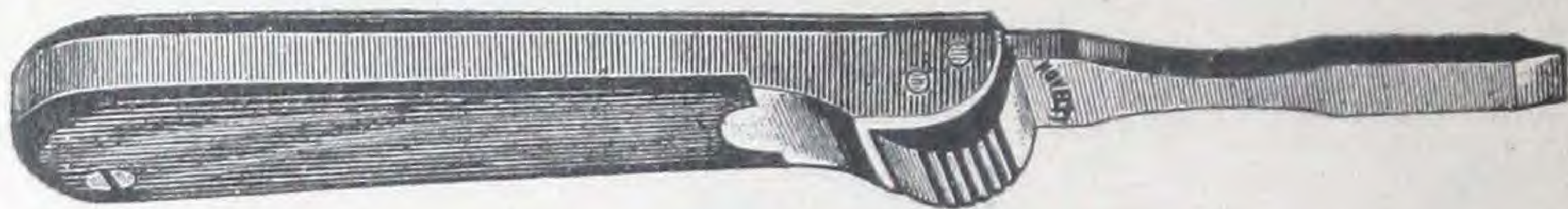
Trade Word.	List No.	Price.
Purlieu	1739	With wrists ----- per pair \$2 00
Purling	1740	Without wrists -- " " 1 50





# NOVELTY POCKET SCREW DRIVER OR KNIFE.

Closes up perfectly. The blade slides up into the handle, and when closed, the tool does not occupy more room than an ordinary pocket knife, and does not wear out the pocket.



Trade Word.	List No.			Price.
Pursuant	1806	Screw Driver	each	\$0 60
Pursue	1821	Pocket Knife	"	50

# CHAMPION'S SCREW DRIVER.



Trade Word.	List No.	Size Inches.		Price.
Purvey	3680	2½	each	\$0 35
Purveyance	3681	4	"	45
Purveying	3682	6	"	60
Purveyor	3683	8	"	80
Purvey	3684	10	"	1 00
Purveyed	3684½	12	"	1 20

# VULCAN INSULATED SCREW DRIVER.



This screw driver may be safely used in connection with electric lights of high potential.

Trade Word.	List No.			Price.
Push	1814	Size 2½ inches	each	\$0 60



## POST HOLE AUGERS.

Trade Word.	List No.		Price.
Raffle	1579	Auger to bore 12 inches in diameter .....	each \$4 50
Raffleing	1580	" " " 14 " " " .....	" 5 00

## RISING FORKS.

Trade Word.	List No.	Length—	12 ft.	14 ft.	16 ft.
Raft	1582	.....	each \$2 10	\$2 20	\$2 40

## DIGGING BARS.

Trade Word.	List No.		Price.
Rafter	1583	1 $\frac{1}{8}$ inch round digging bar 8 feet long, weight 20 to 30 pounds .....	each \$3 00

## TAMPING BAR.

Trade Word.	List No.		Price.
Rafted	1584	Wood, 7 ft. long .....	each \$1 60

## CROW BARS.

Trade Word.	List No.		Price.
Raftered	1585	4 ft. long .....	each \$0 50
Rafty	1586	6 " " .....	" 80

## PICKAXE.

Trade Word.	List No.		Price.
Reputable	1587	Without handles .....	each \$1 00
Repute	1588	Handles only .....	" 45

## CARRYING HOOKS.

Trade Word.	List No.		Price.
Requisite	1589	With swivel .....	each \$4 00
Requital	1590	Without handle .....	" 4 00

## CANT HOOKS.

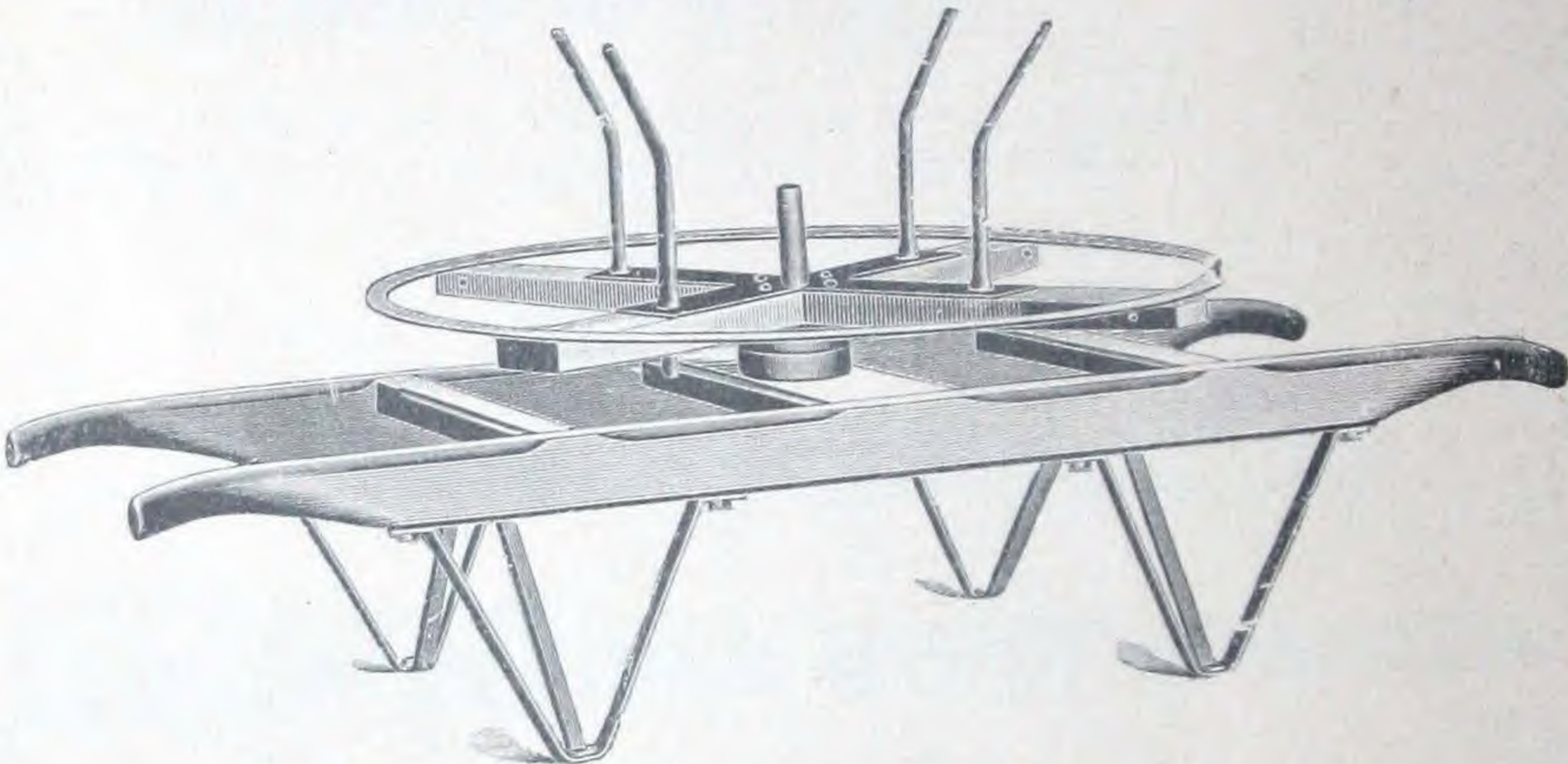
Trade Word.	List No.		Price.
Resind	1591	Length, 4 ft. ....	each \$2 40



PIKE POLES.

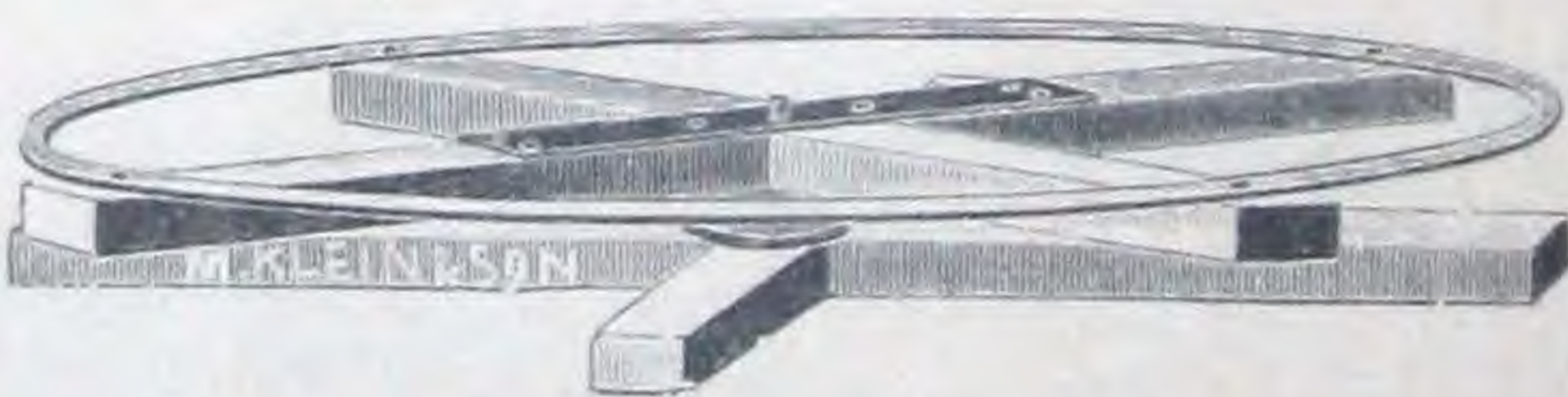
Trade Word.	List No.	Length—	12 ft.	14 ft.	16 ft.	18 ft.
Radish	1593	each	\$1 45	\$1 60	\$1 75	\$1 90

COMBINATION PAY-OUT REEL.



Trade Word.	List No.		Price.
Radius	1594	Combination pay-out reel and take up	each \$16 50
Radix	1595	Straps per set	“ 5 00

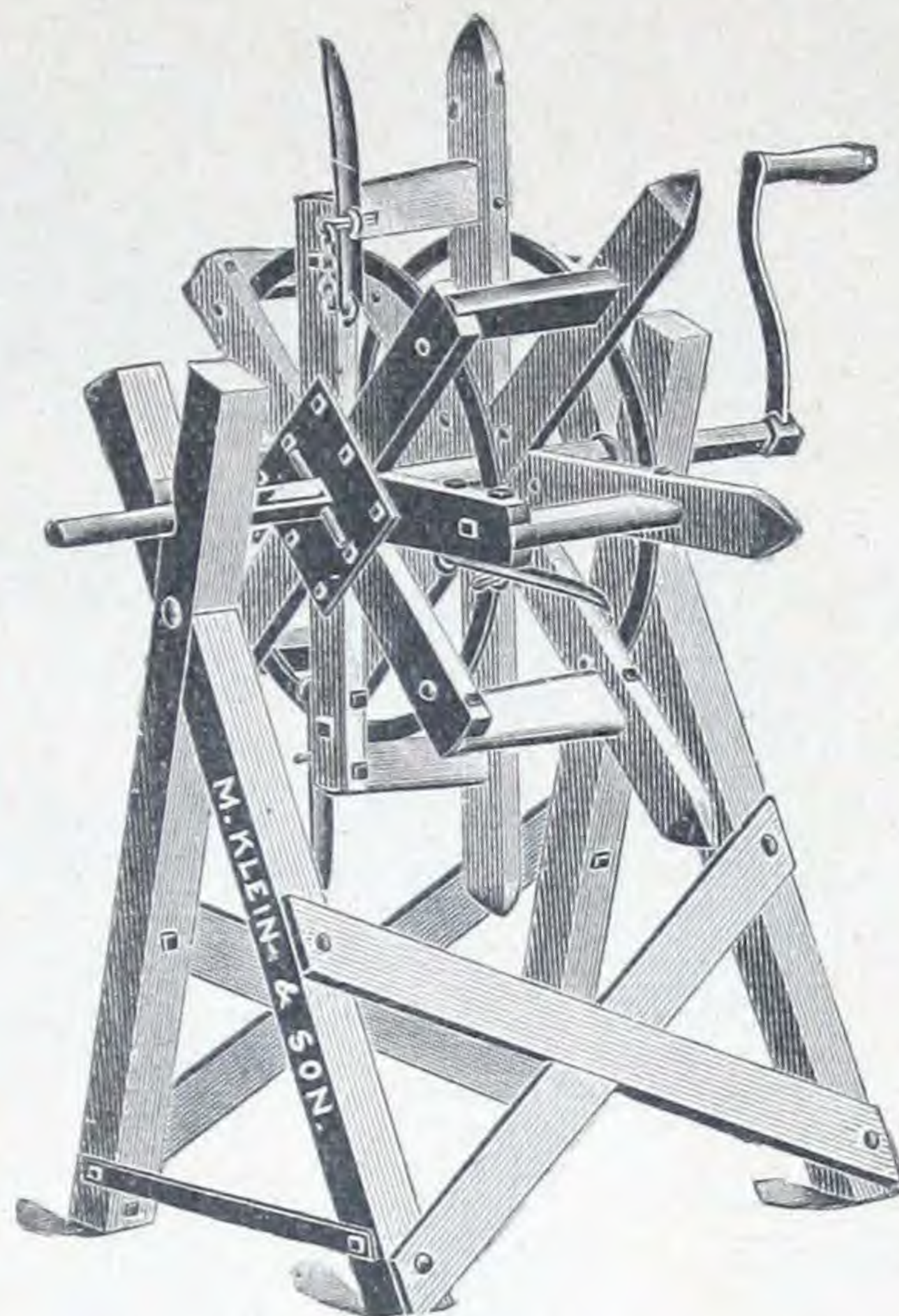
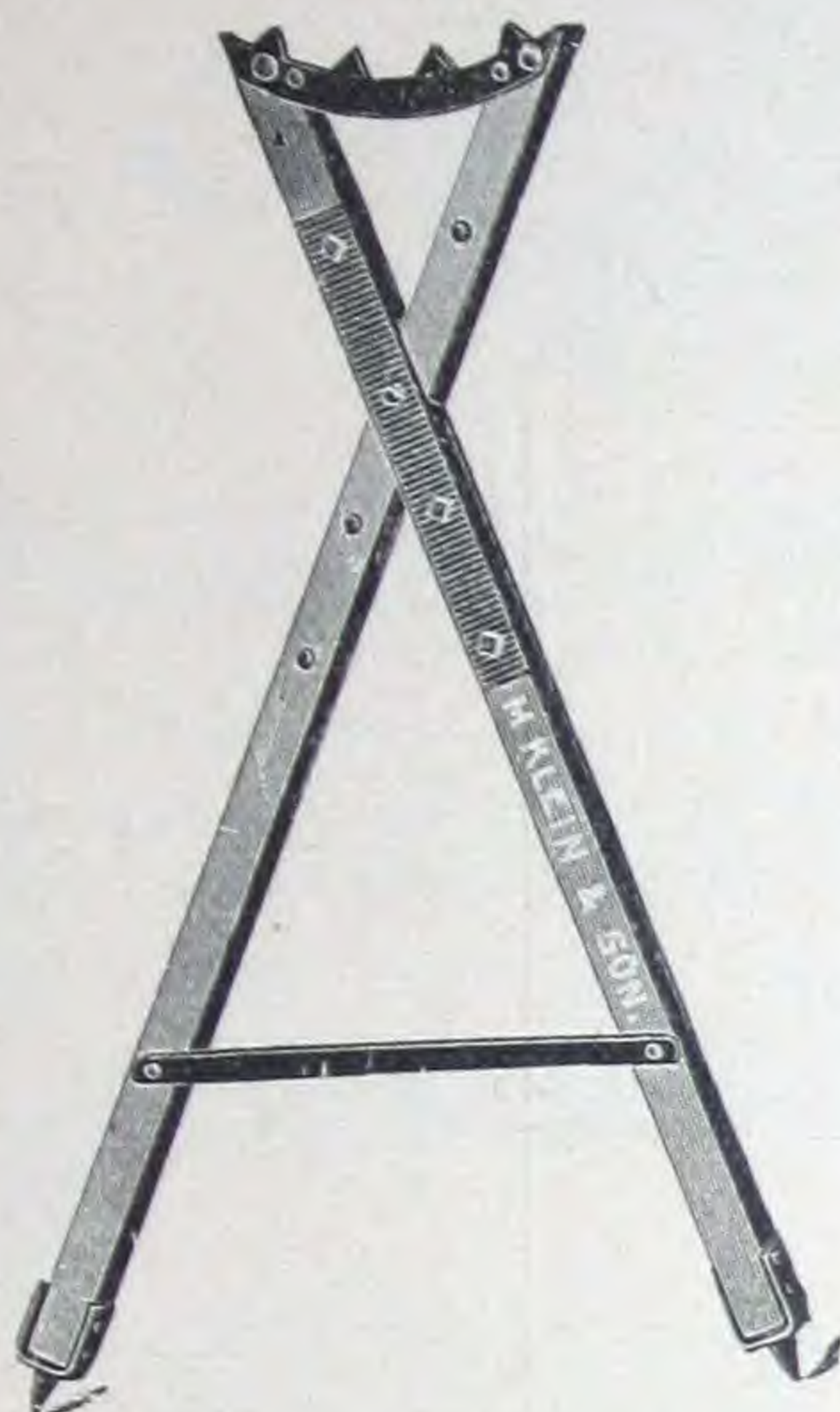
COMMON PAY-OUT REEL.



Trade Word.	List No.		Price.
Raff	1596	Common pay-out reel	each \$7 50



## POLE SUPPORTERS. TAKE-UP REEL.



Trade Word.	List No.		Price.	Trade Word.	List No.		Price.
Radicalism	1597	Pole crotch.....each	\$7 50	Radically	1598	Take-up reel.....each	\$15 00

## EASTERN CLIMBERS.



Trade Word.	List No.		Price.
Radicalism	1599	Eastern climbers.....per pair	\$3 75
Radication	1600	Straps....." "	1 25

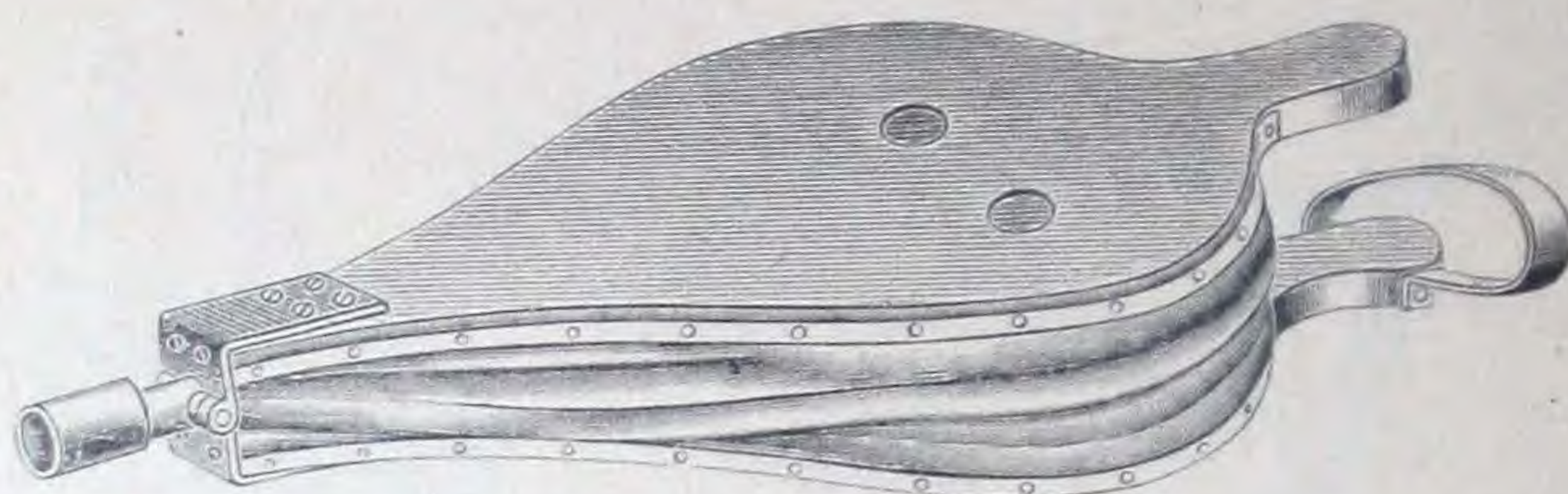
## WESTERN CLIMBERS.



Trade Word.	List No.		Price.
Radiolities	1601	Western climbers.....per pair	\$2 50
Radiometer	1602	Straps....." "	1 25



## ARMATURE BELLOWS.

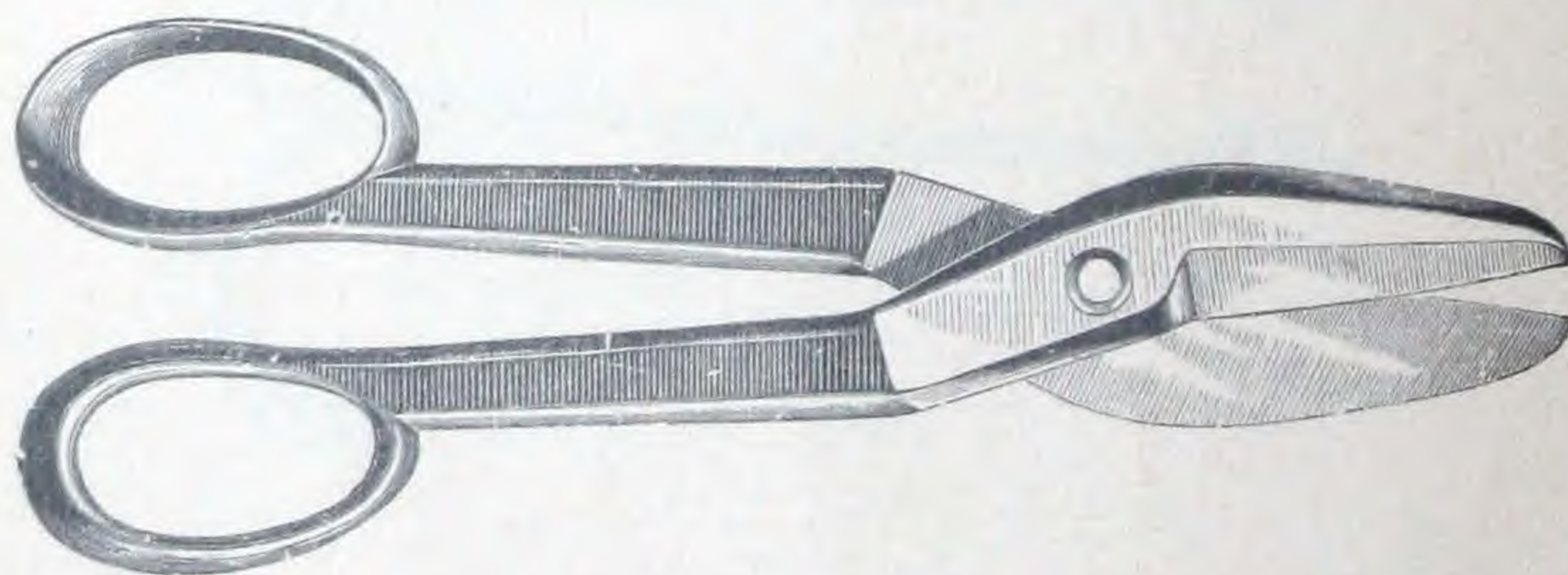


Patented April 5, 1892.

OUR IMPROVEMENT which is readily seen in the above illustration, consists in doing away entirely with "ye" ancient leather hinge, which is so annoying and expensive, and using instead a patent metallic hinge in combination with a solid gas pipe spout, securely fastened to the ends of the bellows frames, and working through the opening in the metallic hinge substantially as set forth. Nozzles are provided with a thread and coupling when desired, enabling the operator to force the air to any required distance and at any angle.

Trade Word.	List No.	Style No.	Price.
Puppyism	3287	8	each \$1 50
Pupilage	3287a	9	" 1 65
Pupil	3287b	10	" 1 80
Pup	3287c	12	" 2 35

## COMMUTATOR BRUSH SNIPS.



Trade Word.	List No.	Price.
Purana	1731 14 inches long, cut 4 inches	each \$2 75
Puranic	1732 8 " " " 2½ "	" 1 50

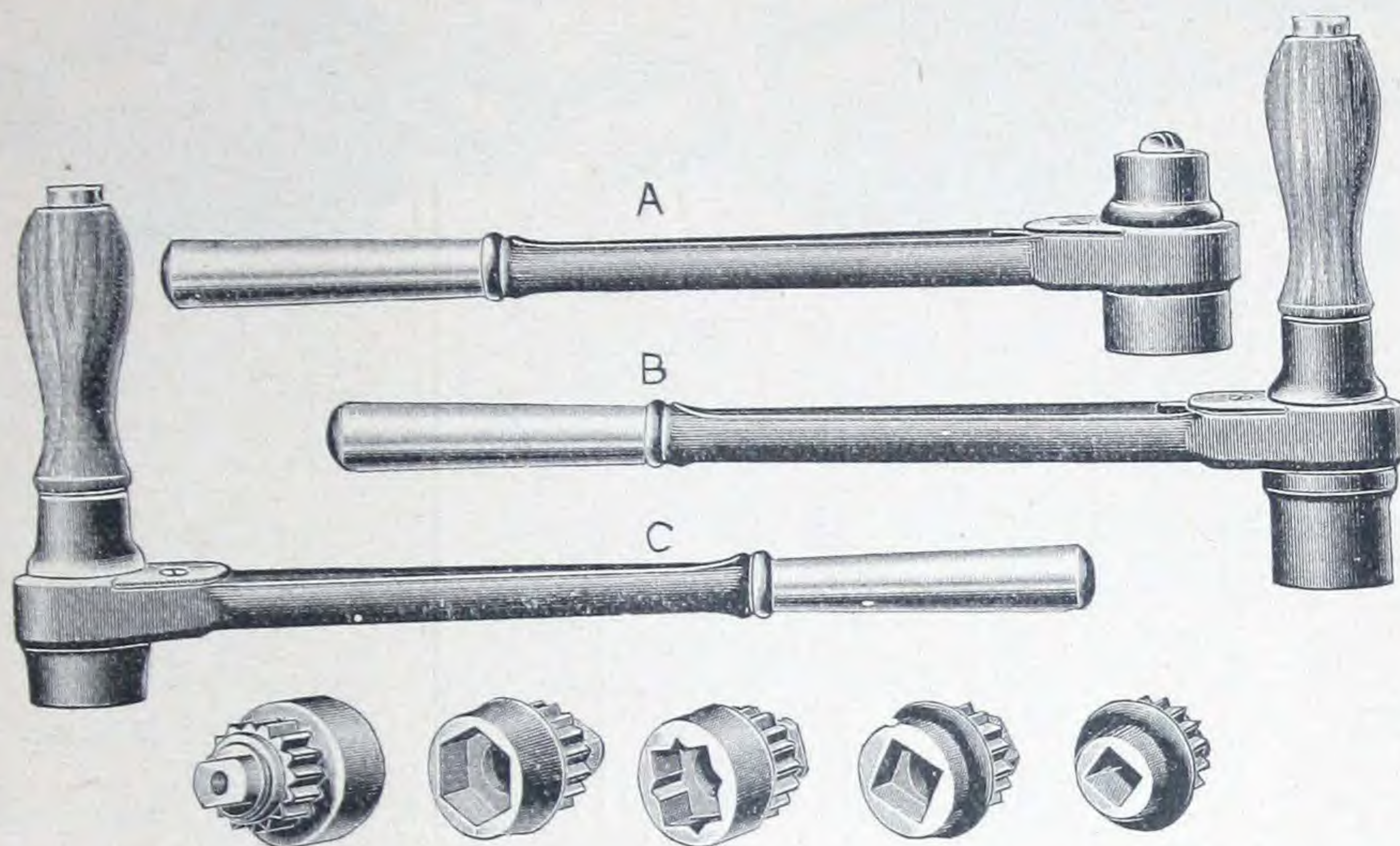
## LAG SCREW WRENCH.



Trade Word.	List No.	Price.
Purely	1904	each \$1 25



## LAG SCREW WRENCH.



The above illustration represents an exceedingly well made wrench, designed for turning coach screws, nuts or bolts, either way, without taking off the wrench. These wrenches are easily changeable for various sizes, by means of the different sockets.

Trade Word.	List No.		Price.
Pushing	3288	12 inch handles, style A.....each	\$1 75
Putrid	3289	12 " " " " C....."	2 00
The sockets for this wrench will turn nuts measuring (smaller outside diameter) $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ , 1, $1\frac{1}{8}$ , $1\frac{1}{4}$ inch square. $\frac{3}{4}$ , $\frac{7}{8}$ , 1, $1\frac{1}{8}$ , $1\frac{1}{4}$ inch hexagon "			
			40
Putridness	3290	16 inch handles, style B.....each	\$3 00
The openings in these sockets are (smaller diameter) $1\frac{1}{8}$ , $1\frac{1}{4}$ , $1\frac{7}{8}$ inch either square or hexagon....."			
			75
Putting	3291	20 inch handles, style A or C.....each	\$4 50
With sockets to fit (smaller outside diameter) nuts $1\frac{1}{4}$ , $1\frac{7}{8}$ , $1\frac{5}{8}$ inch square or hexagon....."			
			1 00

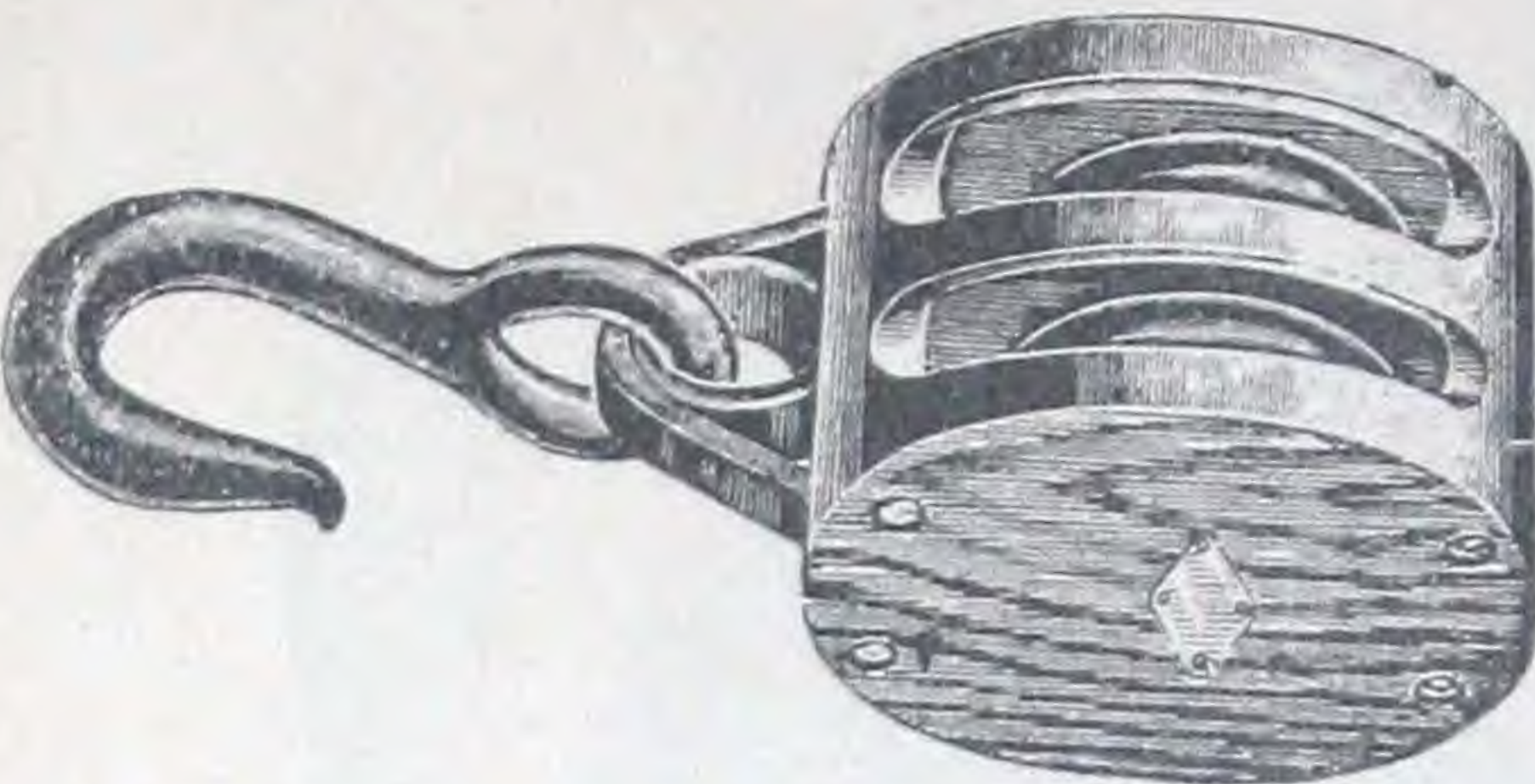
These prices include only one socket.

The cut B shows a long socket such as we make only to order.

The No. 3291 with long socket is particularly adapted to handling nuts under the broad tread on street railway rails.



WOOD TACKLE BLOCKS.



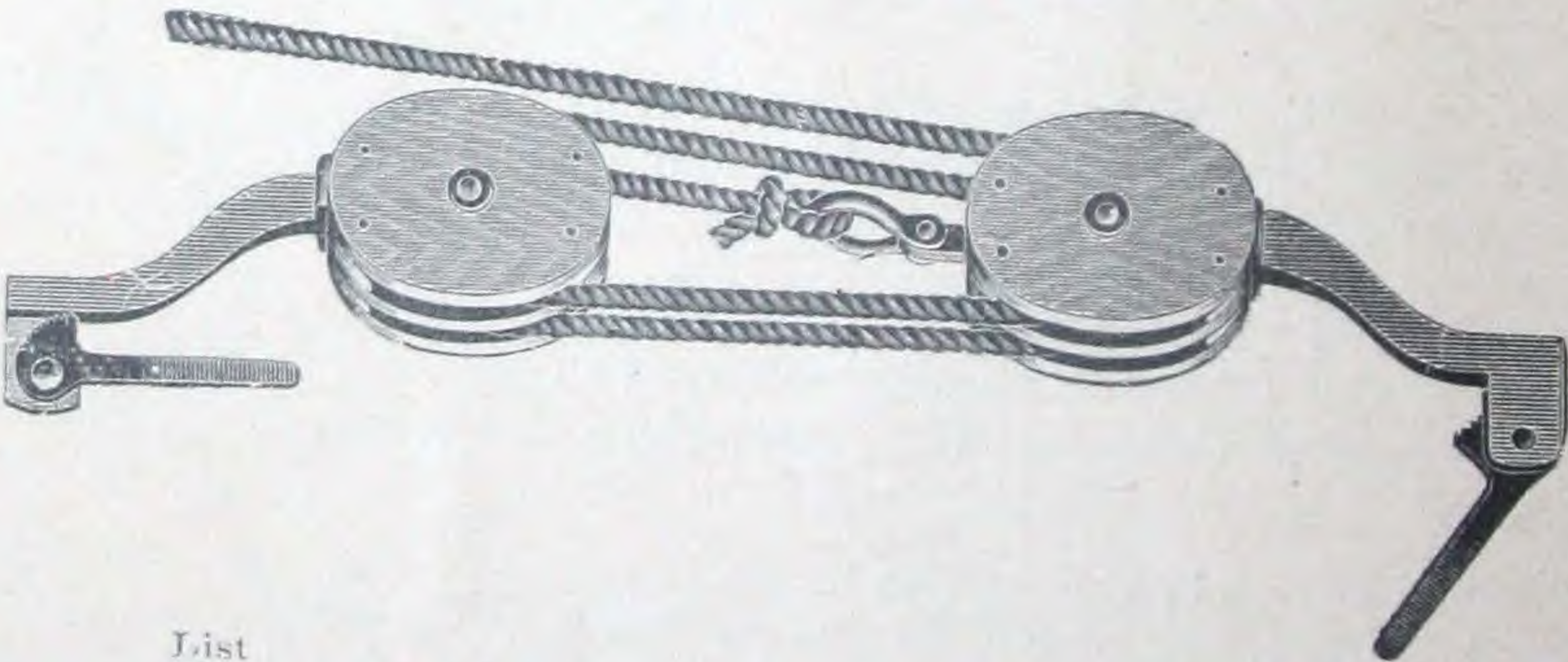
Double Sheave.



Single Sheave.

DOUBLE.		Price.	Size Block.	Size Sheaves.	Size Rope.	Price.	SINGLE.	
Trade Word.	List No.						List No.	Trade Word.
Puttock	3685	\$1 30	3	1 $\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{3}{8}$	$\frac{3}{8}$	\$0 70	3691	Pyroxene
Putty	3686	1 60	4	2 $\frac{1}{4}$ x $\frac{5}{8}$ x $\frac{3}{8}$	$\frac{1}{2}$	85	3692	Python
Puzzle	3687	1 75	5	3 x $\frac{3}{4}$ x $\frac{3}{8}$	$\frac{5}{8}$	90	3693	Rabate
Puzzleing	3688	2 00	6	3 $\frac{1}{2}$ x1 x $\frac{1}{2}$	$\frac{3}{4}$	1 10	3694	Rabato
Pyramid	3689	2 40	7	4 $\frac{1}{4}$ x1 x $\frac{1}{2}$	$\frac{7}{8}$	1 30	3695	Rabbet
Pyrotic	3690	2 85	8	4 $\frac{3}{4}$ x1 $\frac{1}{8}$ x $\frac{5}{8}$	1	1 65	3696	Rabbeting

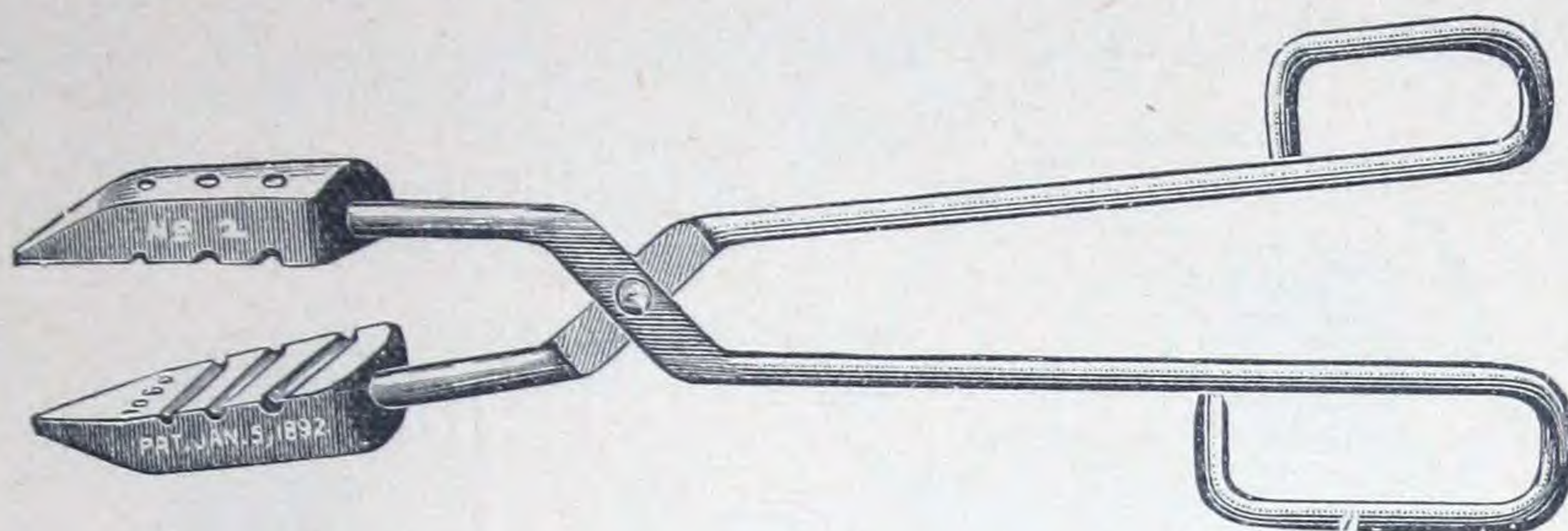
PULLEY BLOCKS AND ECCENTRIC CLAMPS COMBINED.



Trade Word.	List No.	Price.	
Rabinism	1604	3 $\frac{1}{2}$ inch blocks complete with 60 ft. rope for No. 9 wire	each \$6 00
Rabble	1605	3 $\frac{1}{2}$ inch blocks without rope	" 5 00
Rabinist	1606	5 " " complete with 60 ft. rope for No. 2 wire	" 10 00
Rabdology	1607	5 inch blocks without rope	" 8 00



## THE EXCELSIOR SOLDERING COPPER.



This copper solders a joint so completely, so thoroughly, and with so little waste of solder and time that no company can well afford to be without one for three reasons.

1st. You can solder a joint in rubber insulated wire without burning the rubber.

2d. The copper heats the joint while you poke the solder in. Cut off one inch of solder and you have enough and no waste.

3d. You can heat the copper and then climb the highest pole and solder a joint or two or three of them.

Trade Word.	List No.			Price.
Pupilage	1723	1 lb. ....	each	\$1 50
Pupillary	1724	1½ lb. ....	"	1 75
Puppet	1725	2½ " ....	"	2 20

## SOLDER LADLE.



Trade Word.	List No.			Price.
Puppetry	1721	Length of handle 5 inches .....	each	\$0 75

## SOLDERING COPPER AND IRONS.

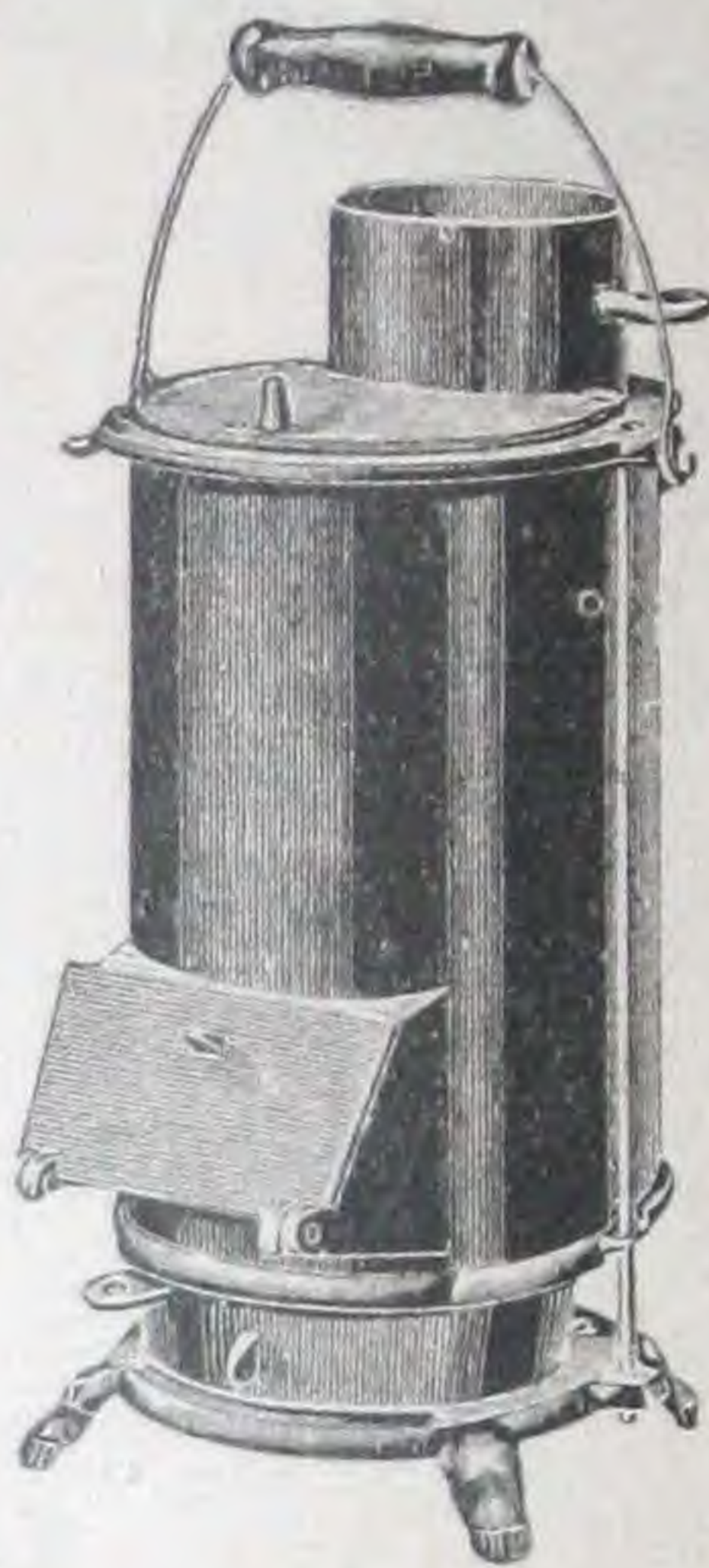
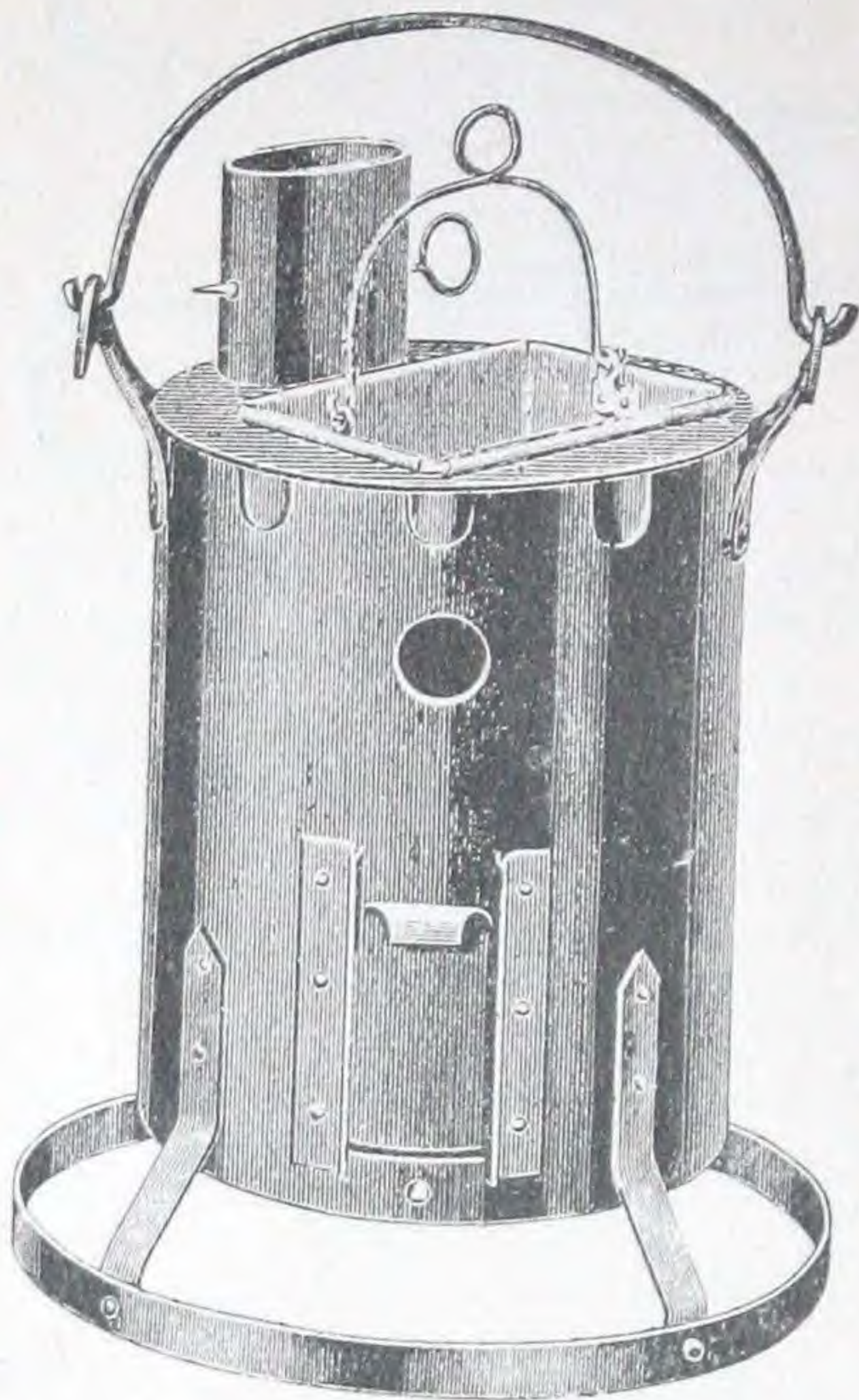


Trade Word.	List No.			Price.
Puppy	1722	Any size .....	per pound	\$0 50



SOLDERING FURNACES.  
FOR HEAVY ELECTRIC LINE WORK.

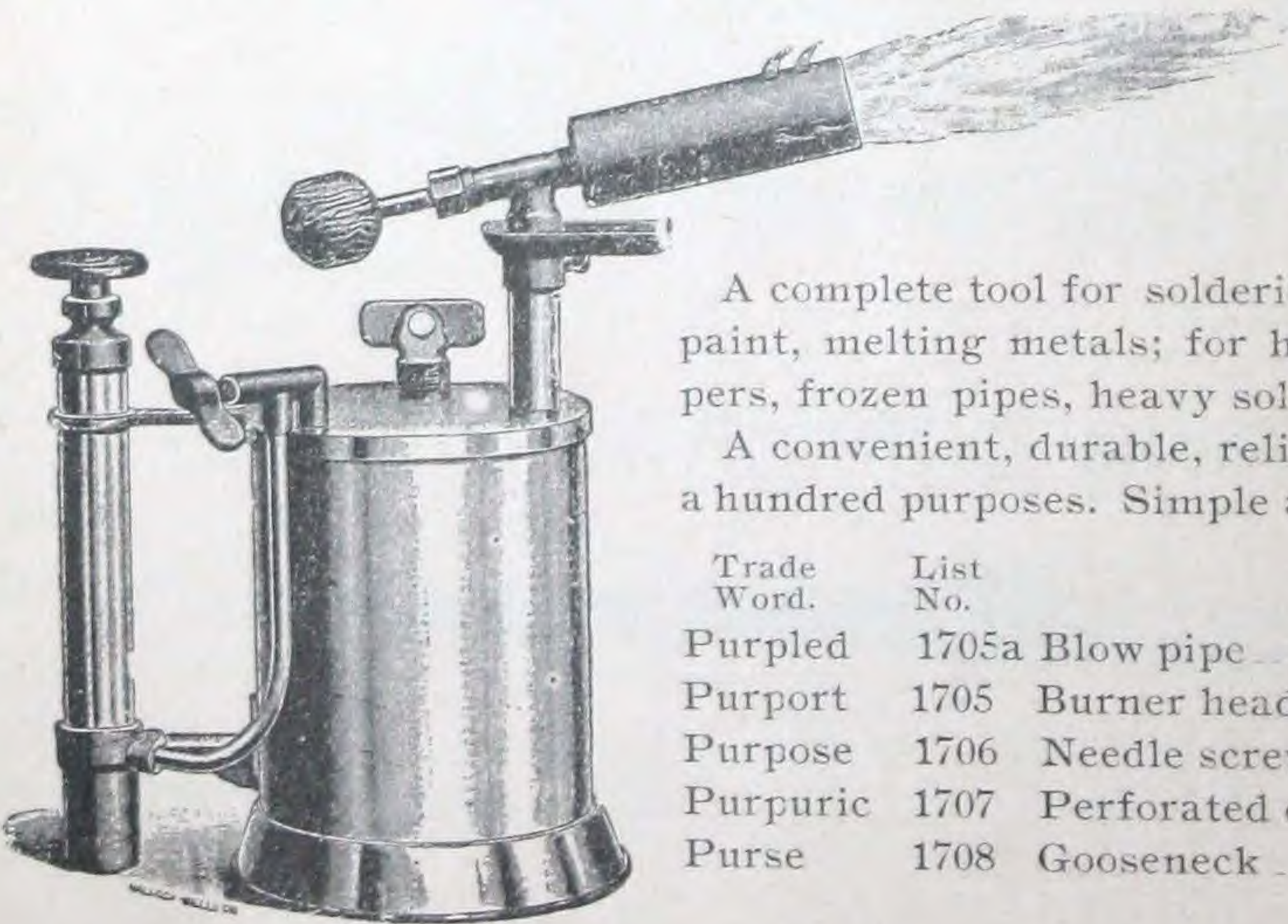
PORTABLE SOL-  
DERING STOVE.  
FOR CHARCOAL.



Trade Word.	List No.	Price.	Trade Word.	List No.	Price.
Purloin	1699	each \$8 00	Purple	1700	each \$3 00

BLOW PIPE OR TORCH.

FOR GASOLINE.



A complete tool for soldering, brazing, burning paint, melting metals; for heating soldering coppers, frozen pipes, heavy soldered joints, etc., etc.

A convenient, durable, reliable tool, adapted for a hundred purposes. Simple and safe in operation.

Trade Word.	List No.	Price.
Purpled	1705a	Blow pipe each \$7 50
Purport	1705	Burner head complete " 3 00
Purpose	1706	Needle screw " 40
Purpuric	1707	Perforated cylinder " 96
Purse	1708	Gooseneck " 70



S<sup>TREET</sup> & R<sup>AILROAD.</sup>  
SAFE! RELIABLE!

# AUTOMATIC CROSSING SIGNAL SYSTEM.

SIMPLE, EFFICIENT,  
AND ECONOM-  
ICAL.

It may be arranged so that the signal will operate on SINGLE or DOUBLE track in either one or both directions as may be required.

IT IS ALWAYS ON  
GUARD.



FOUR ORDINARY  
BATTERIES WILL  
OPERATE IT.

Circuits may be varied to suit any requirements.

Easy to install.

Inexpensive to operate.

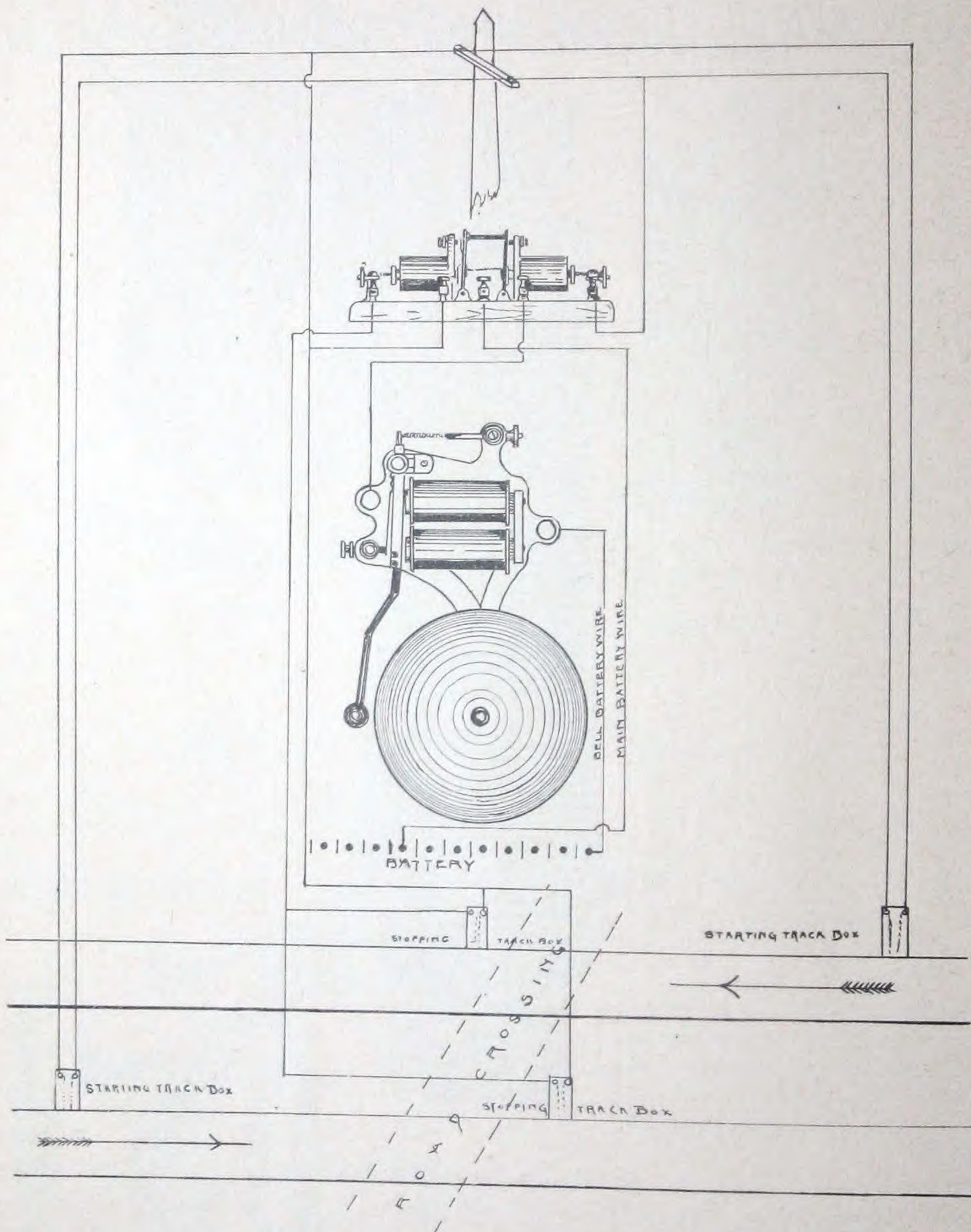
IT NEVER SLEEPS.

Trade Word.	List No.	Price.
Sardonyx	3728	Price, signal, one starting and one stopping box, each \$200 00
Liberal reduction made where two or more bells are used at same crossing.		



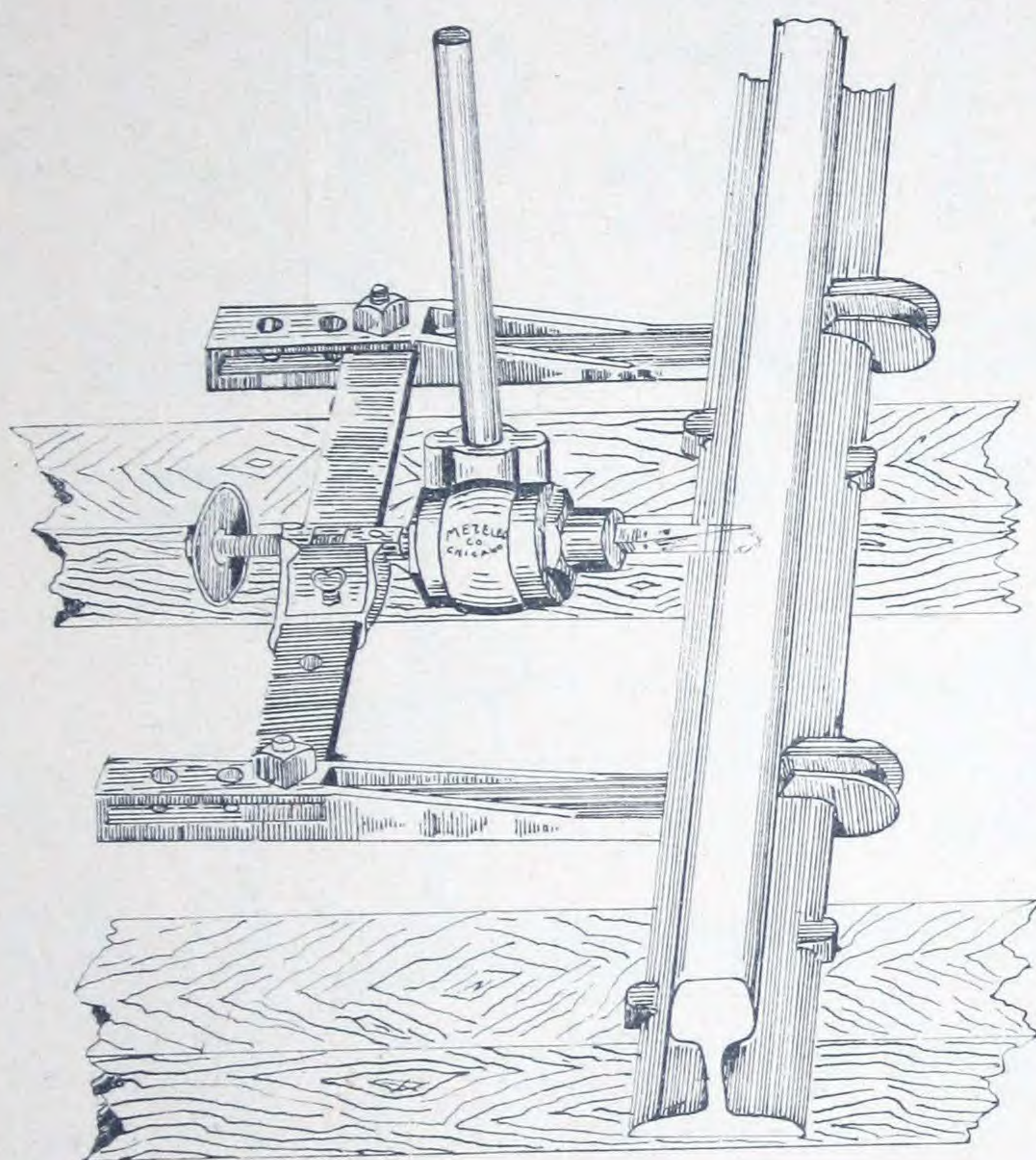
## S. &amp; R. AUTOMATIC CROSSING SIGNAL.

DESIGN SHOWING MANNER OF WIRING.





## THE SCHUTTLER RATCHET TRACK DRILL.



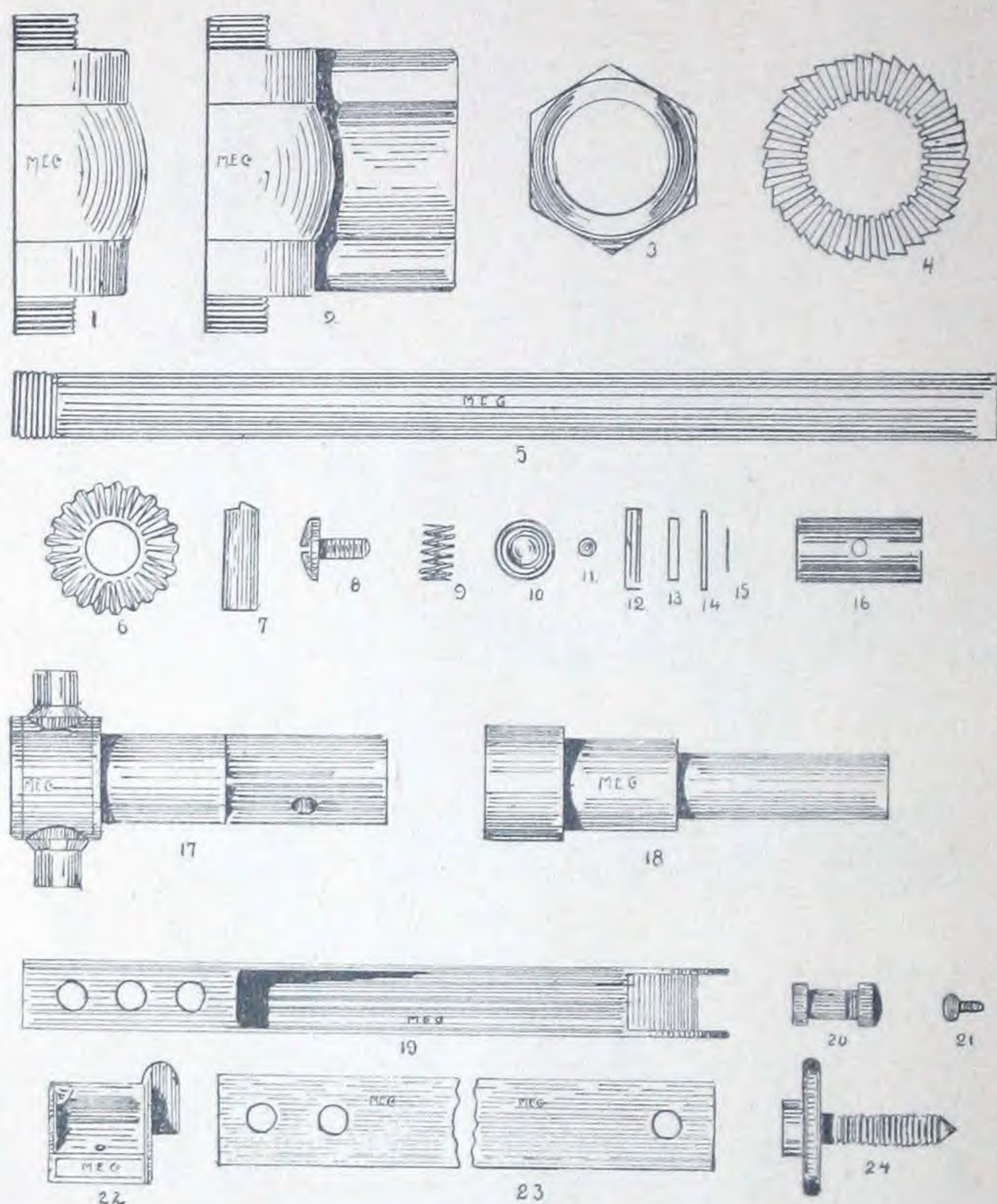
IT SAVES FIFTY PER CENT IN LABOR. WORKS CONTINUOUSLY, by the movement of the handle in both directions, thus accomplishing double the work of any other drill in the same length of time without additional labor. Strong, durable and attached to either inside or outside of the rail WITHOUT INTERFERING WITH PASSING TRAINS, and the holes can be drilled without readjusting the drill. Working parts are interchangeable and made of hardened steel. A casing of malleable iron completely protects all parts from dirt and water.

Trade Word.	List No.		Price.
Rallied	3697	Drill complete .....	each \$20 00
Rally	3698	Extra bits .....	" 1 00



# THE SCHUTTLE RATCHET TRACK DRILL.

## PARTS.

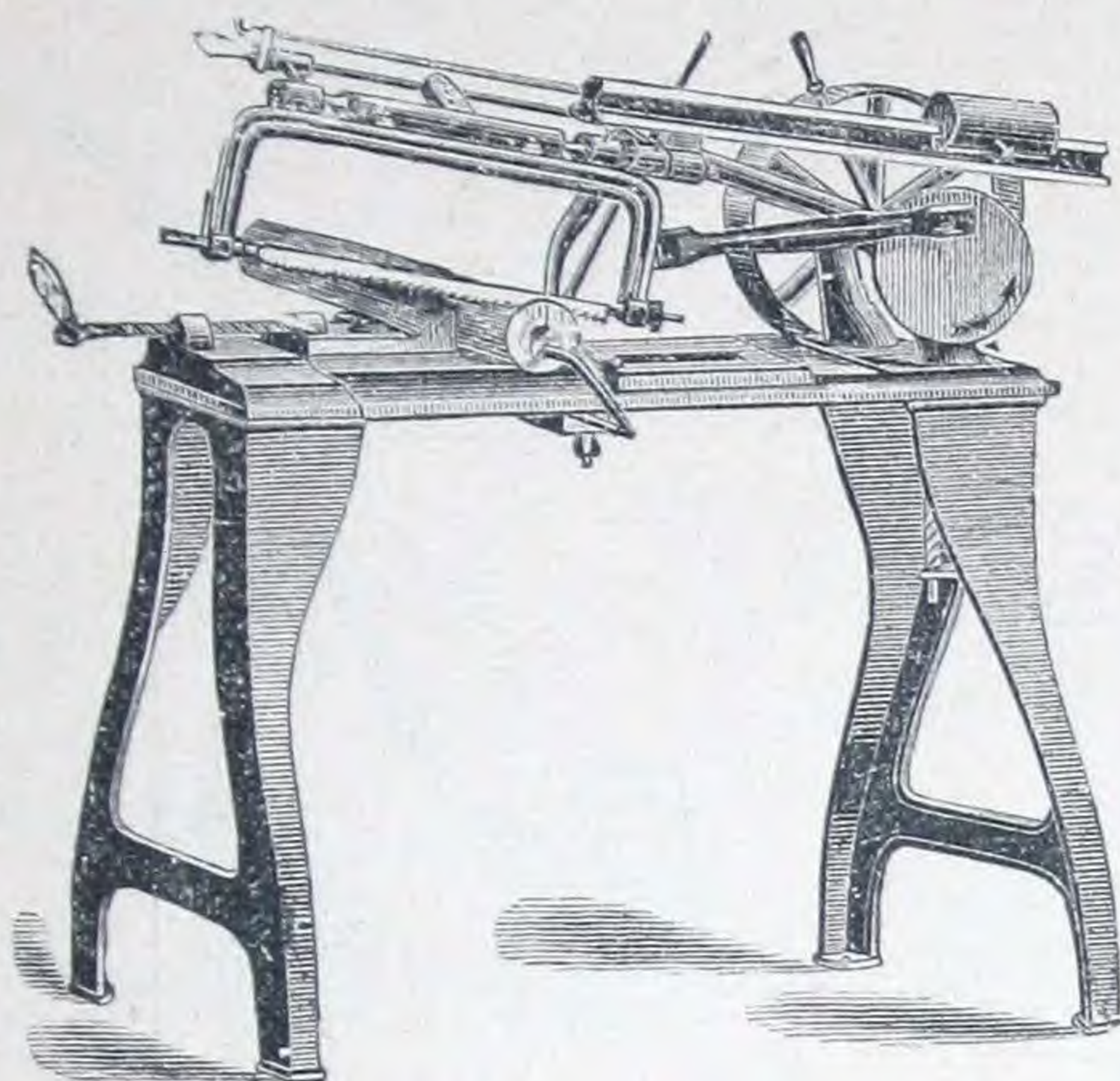


Trade Word.	List No.	Illustration No.	Price.	Trade Word.	List No.	Illustration No.	Price.
Rallying	3699	1	\$2 00	Ramify	3711	13	\$0 10
Ram	3700	2	2 00	Rammed	3712	14	10
Ramadon	3701	3	1 00	Rammer	3713	15	10
Ramage	3702	4	1 50	Rammish	3714	16	90
Ramable	3703	5	1 00	Ramming	3715	17	4 00
Rambler	3704	6	1 30	Rammy	3716	18	2 50
Rambling	3705	7	30	Ramous	3717	19	1 60
Rambooze	3706	8	10	Ramp	3718	20	20
Ramekin	3707	9	20	Rampage	3719	21	10
Raments	3708	10	20	Rampalleau	3720	22	2 50
Rameous	3709	11	05	Rampart	3721	23	1 60
Ramified	3710	12	10	Rampier	3722	24	1 50



## THE STAR POWER SAW.

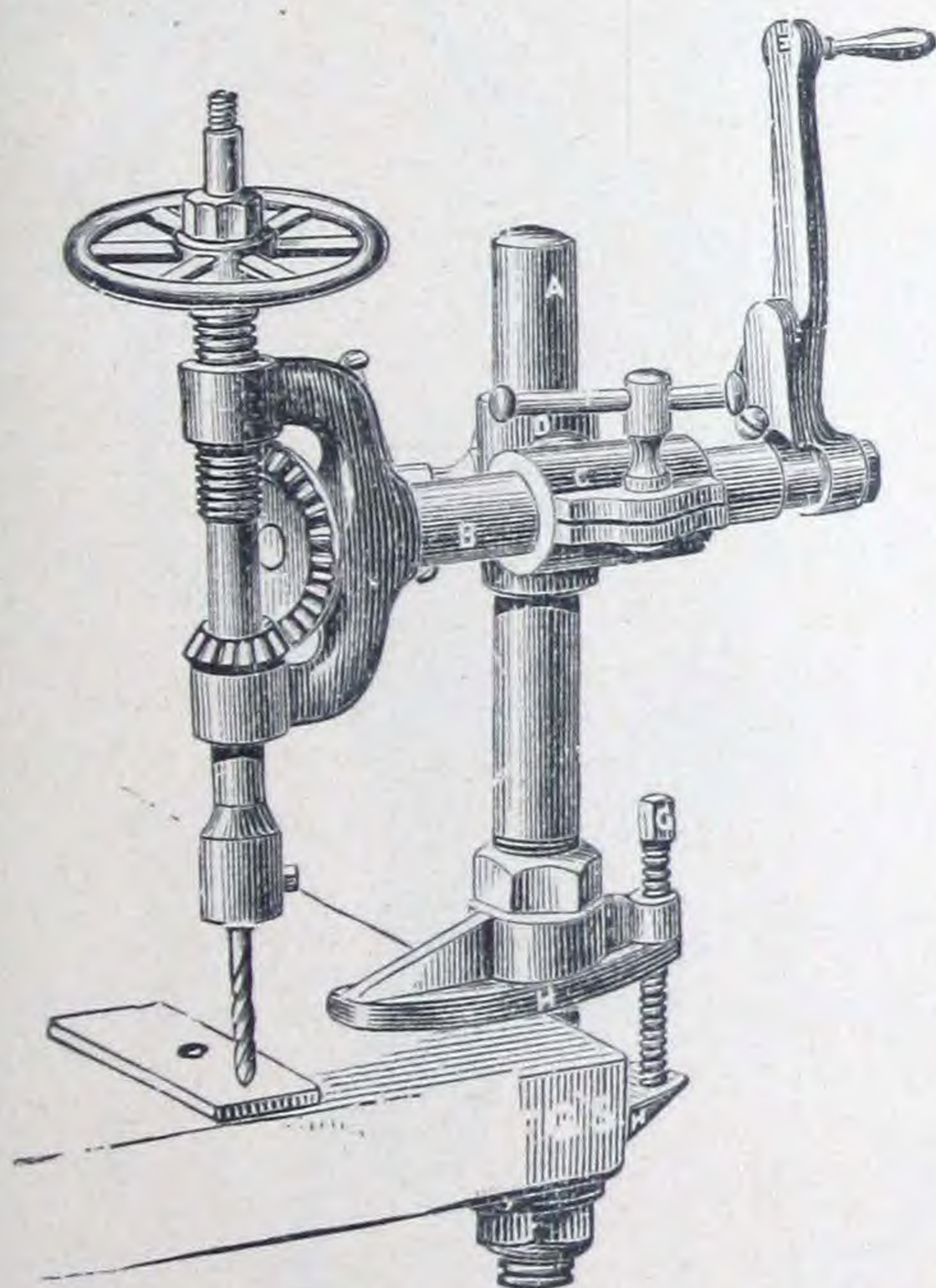
CAN RUN IT  
BY  
HAND  
POWER.



OR CAN USE  
BELT POWER  
ON THE  
SAME  
MACHINE.

This machine will soon pay for itself in labor saving. It is the greatest labor saver in the market for its size and cost.

Trade Word.	List No.	Price.
Rampion	3723	each \$25 00



## IMPROVED PATENT UNIVERSAL ANGULAR AND RATCHET DRILLING MACHINE.

These drilling machines are now made of steel, and are first-class in all respects. For repair work in mills they are almost indispensable, as they can be attached to a broken machine without taking it apart, and swung around to drill at any angle. Many electric lighting companies are providing themselves with these machines.

They will work at any angle. By placing the crank on the drill spindle, it will work with a ratchet or without. We send a chuck with each machine which will hold  $\frac{1}{16}$  to  $\frac{1}{4}$  inch drills.

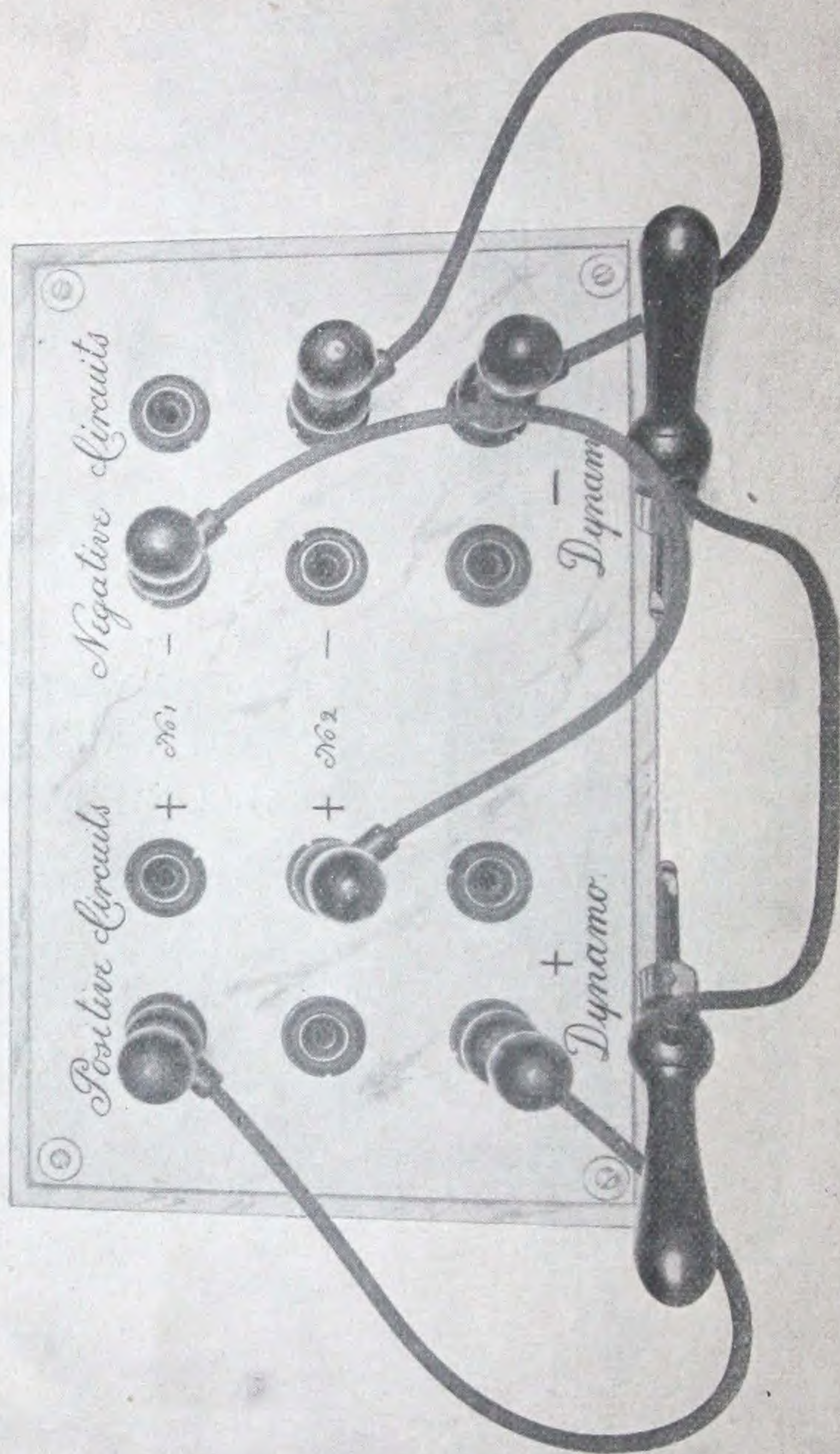
Trade Word.	List No.	Weight	Drills up to	Price.
Rampire	3724	26 lbs.	$\frac{5}{8}$ inch hole	each \$20 00
Rampired	3725	52 "	1 "	25 00
Ramrod	3726	106 "	1½ "	40 00

The No. 3725 drill has two sets of gears, making either speeded or geared back machine.

One twist drill,  $\frac{1}{4}$  inch, with  $\frac{1}{2}$  inch shank, is sent with each machine. For  $\frac{1}{4}$  inch drills and all larger sizes, the  $\frac{1}{2}$  inch shanks are recommended.



## COMBINATION PLUG ARC SWITCH BOARD.



Mounted on white marble.

Trade  
Word.  
Ramson

List  
No.  
3727

Price.

on application





# WESTON'S "GEARED" DIFFERENTIAL PULLEY BLOCKS.

One man can lift from 2000 to 5000 pounds. They hold the load at any point, and will not run down. Easy and smooth in action. Light and convenient to handle.

PRICE LIST OF GEARED BLOCKS.

Trade Word.	List No.	Capacity, Tons.	Hoist, Feet.	CHAINS.			Net Weight Complete, Lbs.	Blocks per Set, Boxed.
				REGULAR LENGTHS.		Extra Main Chain, per Foot.		
				Main Chain, Feet.	Hand Chain, Feet.			
Ragwort	1679	1	8	22	16	\$0 40	62	\$35 00
Raid	1680	2	9	24	18	44	109	45 00
Rail	1681	3	10	26	20	48	159	60 00
Railing	1682	4	11	28	22	54	257	80 00
Raillery	1683	5	12	30	24	60	324	110 00
Raiment	1684	6	13	32	26	70	493	150 00
Rain	1685	8	14	36	28	85	235	210 00
Rainbow	1686	10	16	40	30	1 00	1054	270 00

EXTRA LENGTH OF CHAINS.—For each foot of extra hoist allow 2½ feet of main chain and 2 feet of hand chain. Extra hand chain 38c per foot.

# WESTON'S "DIRECT" DIFFERENTIAL PULLEY BLOCKS.

One man can lift 1000 pounds. They hold the load at any point, and will not run down. Lifting and lowering effected by pulling opposite sides of the slack chain.

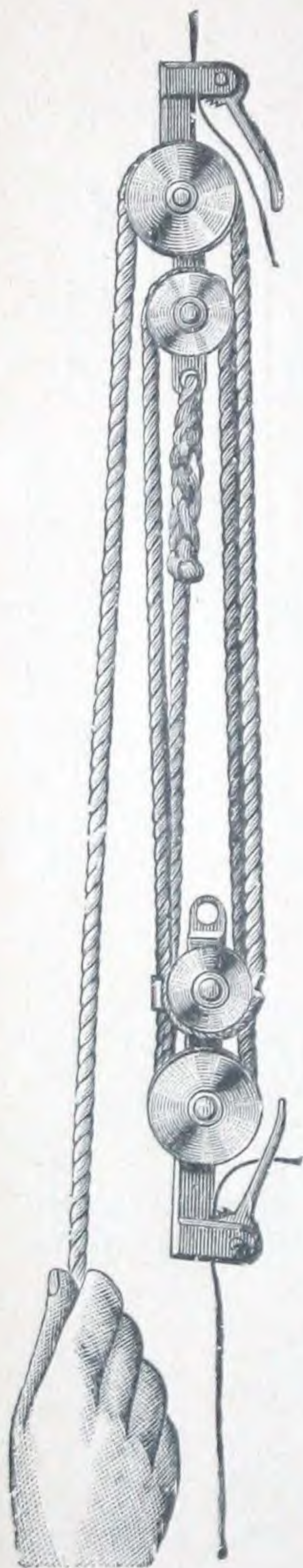
PRICE LIST OF DIRECT BLOCKS.

Trade Word.	Trade No.	Capacity, Tons.	Hoist, Feet.	CHAINS.		Net Weight Complete, Lbs.	Blocks, per Set, Boxed.
				Regular Chain, Feet.	Extra Chain, per Foot.		
Rainbeat	1687	1/8	5	18	\$0 35	11	\$10 00
Raindeer	1688	1/4	6	22	36	22	13 00
Raise	1689	1/2	7	26	38	30	15 00
Rajah	1690	1	8	30	40	51	20 00
Rake	1691	1 1/2	8 1/2	33	42	81	25 00
Raker	1692	2	9	36	44	122	30 00
Raking	1693	3	9 1/2	38	48	173	40 00



## CLARK'S PATENT PULLEY BLOCKS.

THE VERY LATEST DEVICE FOR PUTTING UP ALL KINDS OF WIRE.

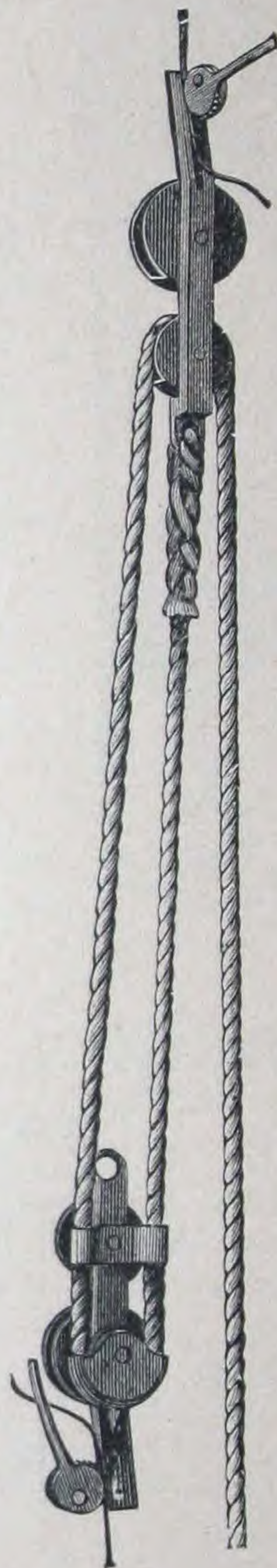


No. 1.

The blocks will not injure the wire, nor injure or strip the insulation. They combine all the virtues of the old style pulley block and come-along, and none of their disadvantages. The weight, including rope, is only three pounds, and the purchase is so great that an ordinary telegraph or telephone wire can be pulled asunder by one man. No time lost with long rope, as the pulleys being open, the need of long rope is obviated, and therefore fifteen to twenty feet of rope is ample for any purpose. You can at pleasure throw the rope over enough pulleys for a heavy pull, as in Cut 1, or for a light pull as shown in Cut 2, without loss of time for adjustment, so common and tedious with the old style pulley blocks, as the pull requires. You can use 1, 2, 3, 4 or 5 pulleys, doubling your strength every time you add a pulley.

The pulley block will hold the wire when tight; the coupling is made by fastening unused end of rope to pulley block, so the lineman can use both hands to make his coupling. The direction of the pull can be changed at will by throwing the rope on or off a pulley, a great advantage to a man on a pole. This is the only tool with which a lineman can, unaided, tighten up a line or take the sag out of a line on top of a pole. The weight is so small that it is no burden for linemen to carry. No parts to wear out or break.

As some linemen prefer to use a hand vise the blocks are so made that one can be attached if desired.



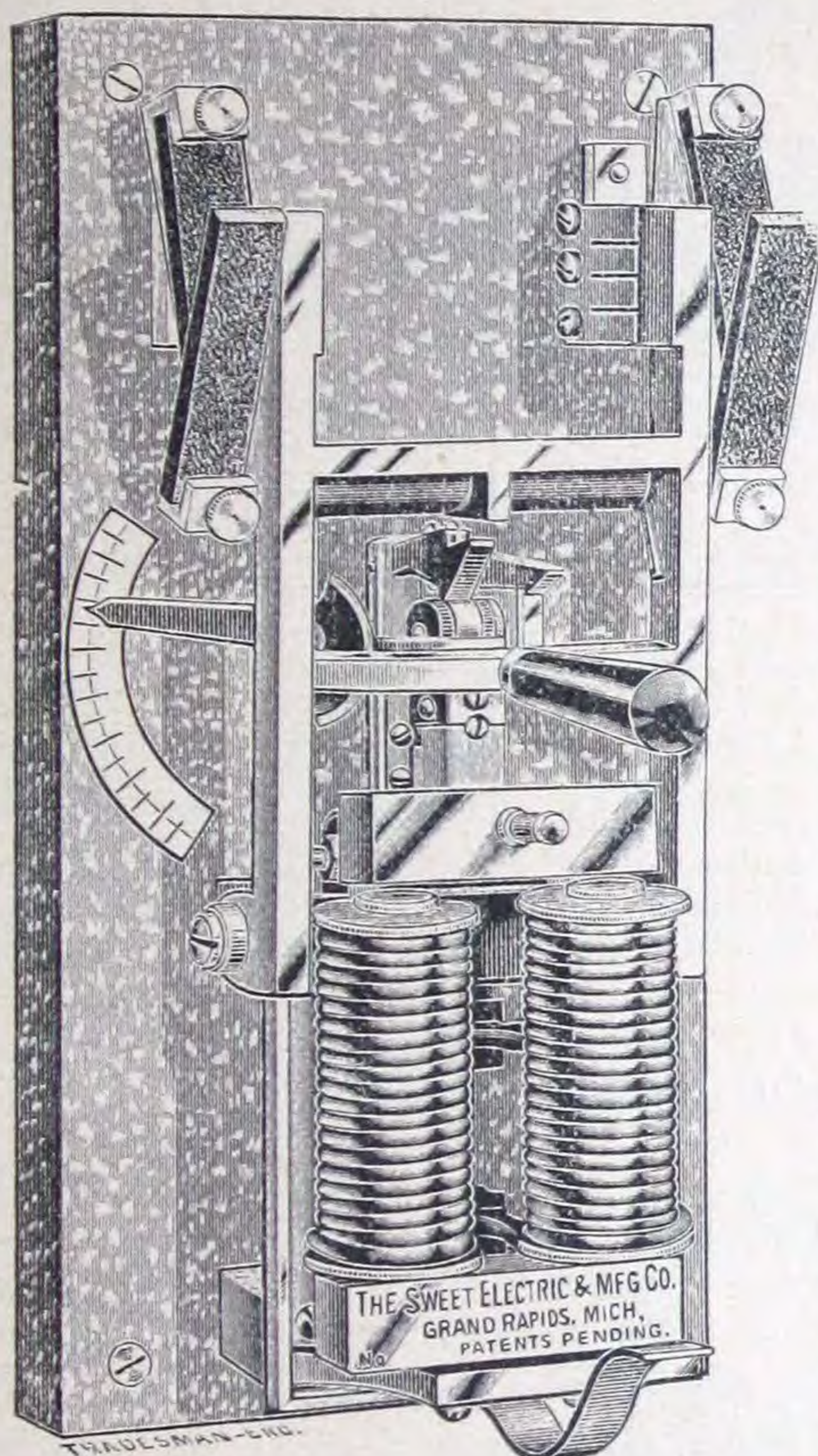
No. 2.

Trade Word.	List No.
Rakish	1623
Ralliance	1624

		Price.
Telephone or telegraph size (will grip wire No. 8 to 16)	each	\$5 00
Electric light size (will grip insulated wire No. 0 to No. 10)	"	6 00



## THE SWEET AUTOMATIC SWITCH.



With the Sweet Limit Switch, every dynamo, motor, lamp circuit, or whatever service it is in connection with, is entirely independent, for the reason that it is adjustable to one-hundredth of an ampere and the current cannot exceed the amount to which the switch is adjusted without opening the circuit. Our switch is equally invaluable in connection with all other electrical apparatus, as it is a positive protection against an overload or overproduction of current. As a protection against fires, caused by short circuits by wires coming in contact in buildings, it automatically opens the circuit, cutting off all currents from entering the building, on the immediate approach of any and all defects which produce an excess of current.

WE HAVE A SWITCH WHICH IS ESPECIALLY ADAPTED TO STREET CAR WORK. This device is just as delicate as those for other work, but the jolting of the car will not affect it, while one-tenth of an ampere over the limit will open the circuit every time.

For telephone, telegraph and fire alarm systems, its value is readily apparent, for with the Sweet Automatic Limit

Switch in circuit you do not need any fuse wire, as our device is more positive than any fuse or other machine now upon the market.

The switch is placed in the circuit, and is set to indicate the number of amperes to be carried. If the current exceeds the limit by from one-twentieth to one-fourth of an ampere—depending upon the size of the switch—the current is at once opened.

Is designed to be used in central stations or isolated plants, in connection with dynamos, motors, in house wiring, and in general, in all cases, in place of fuse wire.

Instrument is mounted on solid marble base and connections are made on the back side. Its mechanical construction makes it very neat and attractive in appearance.



SWEET LIMIT SWITCH.  
MOTOR SIZES.

Trade Word.	List No.	Size, H. P.	Price.	Trade Word.	List No.	Size, H. P.	Price.
Ranculous	3729	$\frac{1}{8}$ to 1	\$16 00	Rancor	3735	10 to 15	\$36 75
Rancescent	3730	1 " 2	20 00	Rancorous	3736	15 " 20	46 75
Ranch	3731	2 " 3	23 50	Rand	3737	20 " 35	66 75
Ranchero	3732	3 " 4	26 75	Random	3738	35 " 40	86 60
Rancid	3733	4 " 7	30 00	Randy	3739	40 " 50	100 00
Rancidity	3734	7 " 10	33 50	Range	3740	50 " 75	133 00

STATION SIZES.

Trade Word.	List No.	Size, Amp.	Price.	Trade Word.	List No.	Size, Amp.	Price.
Ranforce	3741	100	\$60 00	Rank	3744	500	\$120 00
Ranger	3742	200	80 00	Rankle	3745	750	160 00
Ranging	3743	300	100 00	Rankling	3746	1000	186 00

ARC LIGHT CIRCUIT SIZES.

Trade Word.	List No.		Price.
Rankness	3747	T.-H. armature short circuit	each \$47 00
Ransack	3748	" external cut out	" 80 00
Ransom	3749	" combination cut out	" 113 50
Ransomer	3750	External cut out for protecting light circuits or dynamos in other than T.-H. system	" 67 00

INCANDESCENT SYSTEM.

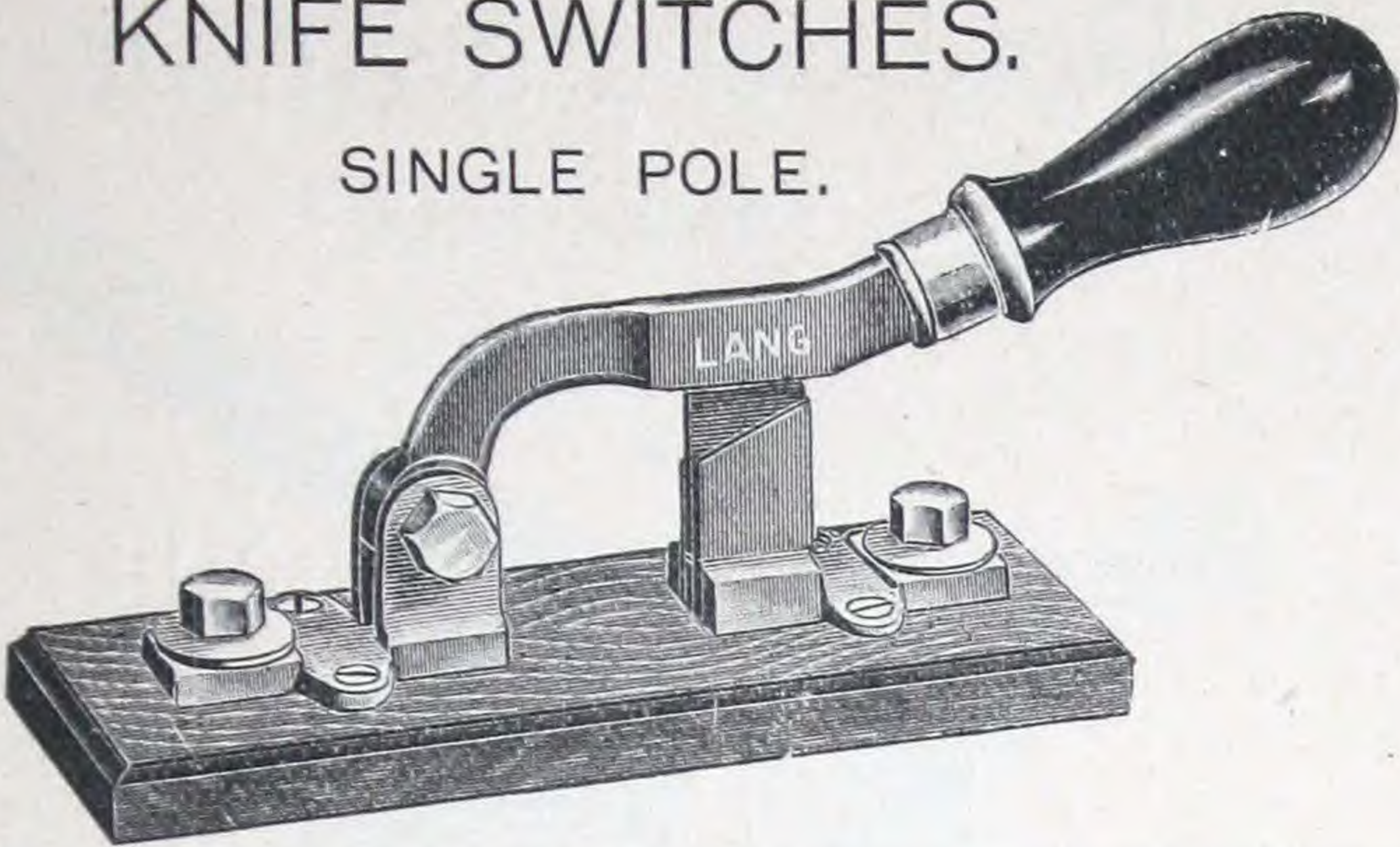
Trade Word.	List No.	Size, 16 C. P. Lamps.	Price.	Trade Word.	List No.	Size, 16 C. P. Lamps.	Price.
Ransoming	3751	1 to 25	\$16 75	Raphe	3757	150 to 200	\$66 75
Rant	3752	25 " 35	20 00	Rapid	3758	200 " 300	86 75
Ranterism	3753	35 " 50	26 75	Rapidity	3759	300 " 500	93 50
Rantipole	3754	50 " 75	33 50	Rapidness	3760	500 " 750	106 75
Rapacious	3755	75 " 100	40 00	Rapillo	3761	750 " 1000	120 00
Rapacity	3756	100 " 150	46 75	Raprier	3762	1000 " 1500	135 00

Prices on special sizes given upon application.  
In ordering state capacity in amperes and voltage of current used.



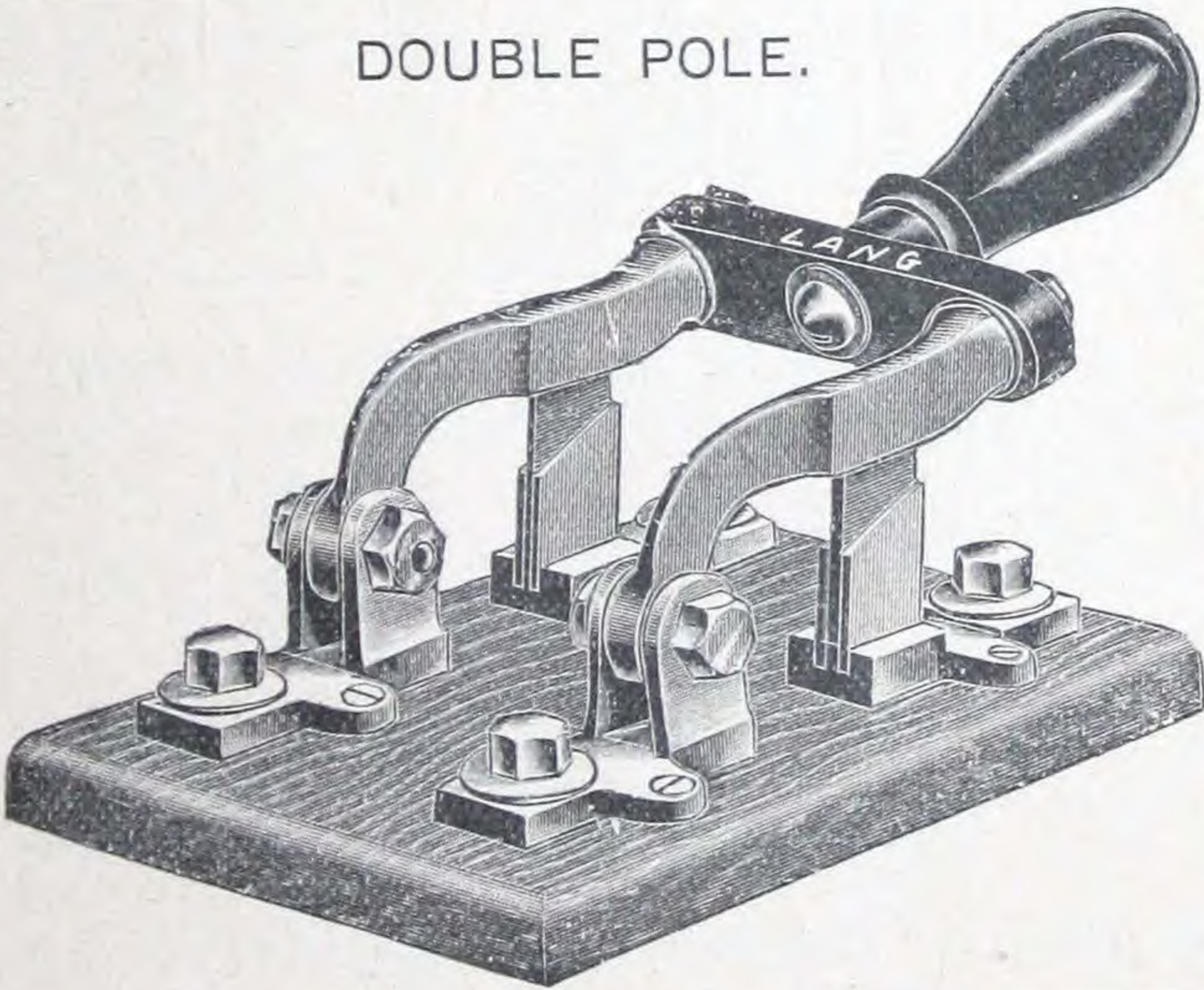
KNIFE SWITCHES.

SINGLE POLE.



Capacity.	Trade Word.	List No.	Mahog. Base. Dipped Metal.	Trade Word.	List No.	Mahog. Base. Polished.	Trade Word.	List No.	Slate Base. Polished.
15 amp. 500 v.	Rapparee ..	454	\$3 00	Rapt .....	3763	\$4 00	Rarity .....	3766	\$4 75
50 " " "	Rapper .....	455	6 00	Raptor .....	3764	8 00	Rascal .....	3767	9 00
100 " " "	Rapport ...	456	8 00	Raptorious	3765	10 00	Rascally ..	3768	12 00

DOUBLE POLE.



Capacity.	Trade Word.	List No.	Wood Base. Dipped.	Trade Word.	List No.	Wood Base. Polished.	Trade Word.	List No.	Slate Base. Polished.
15 amp. 500 v.	Rashed .....	457	\$6 00	Ratch .....	3769	\$8 00	Rational...	3772	\$10 00
50 " " "	Ratafia .....	458	12 00	Ratchet .....	3770	16 00	Rationalist	3773	18 00
100 " " "	Ratan .....	459	16 00	Ration .....	3771	20 00	Ratline .....	3774	22 00

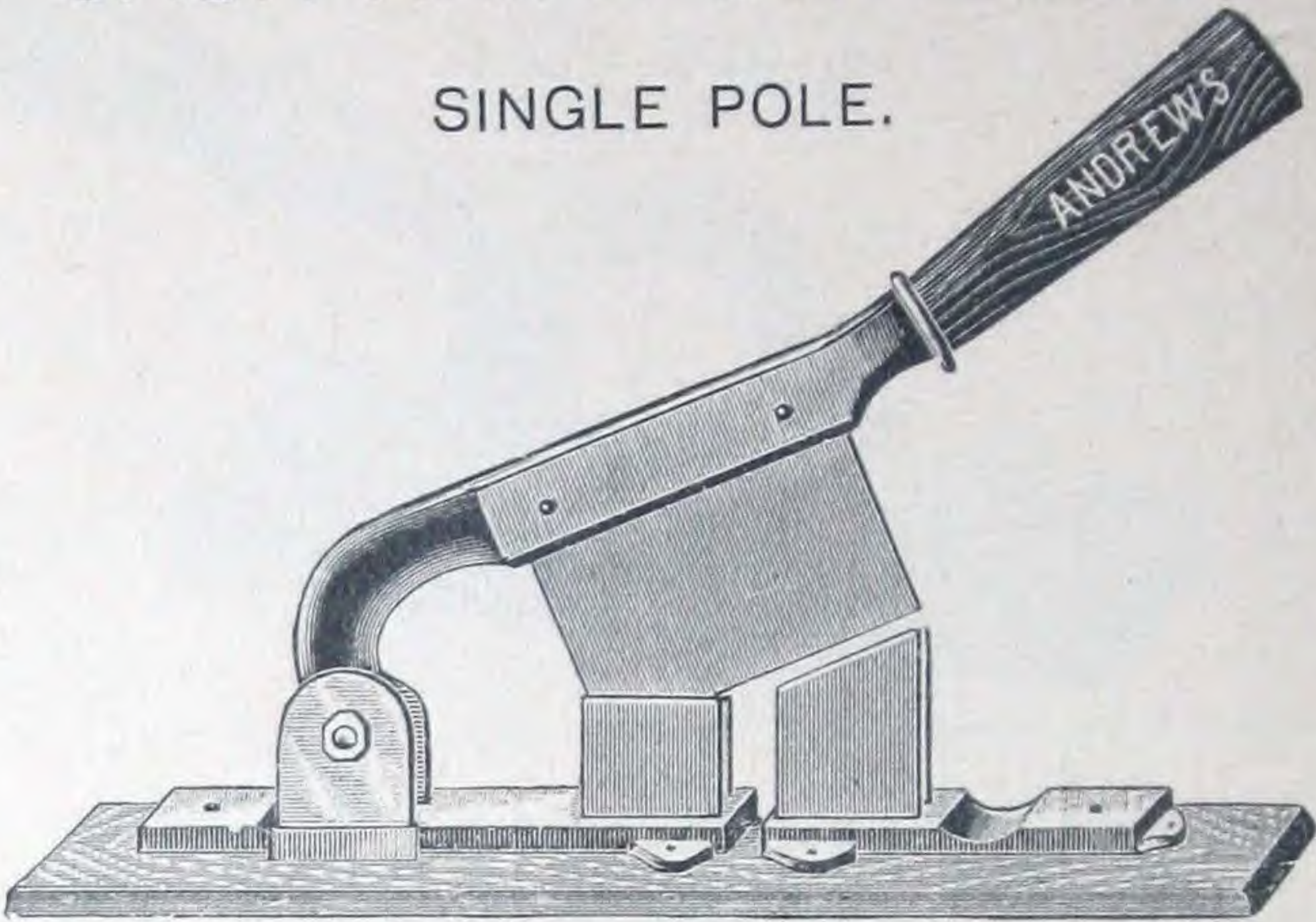
THREE POLE.

Price three times price of single pole.



JACK KNIFE SWITCHES.

SINGLE POLE.



Capacity, Amp.	Trade Word.	List No.	Mahog. Base, Dipped.	Trade Word.	List No.	Mahog. Base, Polished.	Trade Word.	List No.	Slate Base, Polished.
100 to 150	Ratoon.....	461	\$10 00	Ravage .....	3315	\$13 00	Raven .....	3321	\$14 00
250 " 300	Rattle.....	462	15 00	Ravaging...	3316	18 00	Ravening ..	3322	20 00
400 " 500	Rattlebox...	463	21 00	Ravager...	3317	24 00	Ravenous ..	3323	26 00
600 " 750	Raucity ....	464	24 00	Rave .....	3318	30 00	Raver .....	3324	32 00
1000 " 1200	Raucous ....	465	32 00	Ravel .....	3319	40 00	Ravine.....	3325	43 00
1500 " 2000	Raught .....	466	80 00	Ravelin ...	3320	90 00	Ravish.....	3326	95 00

Made in one, two or three pole styles for front bus bars or cable leading through the back.

TWO TONGUE MAIN LINE SWITCH.

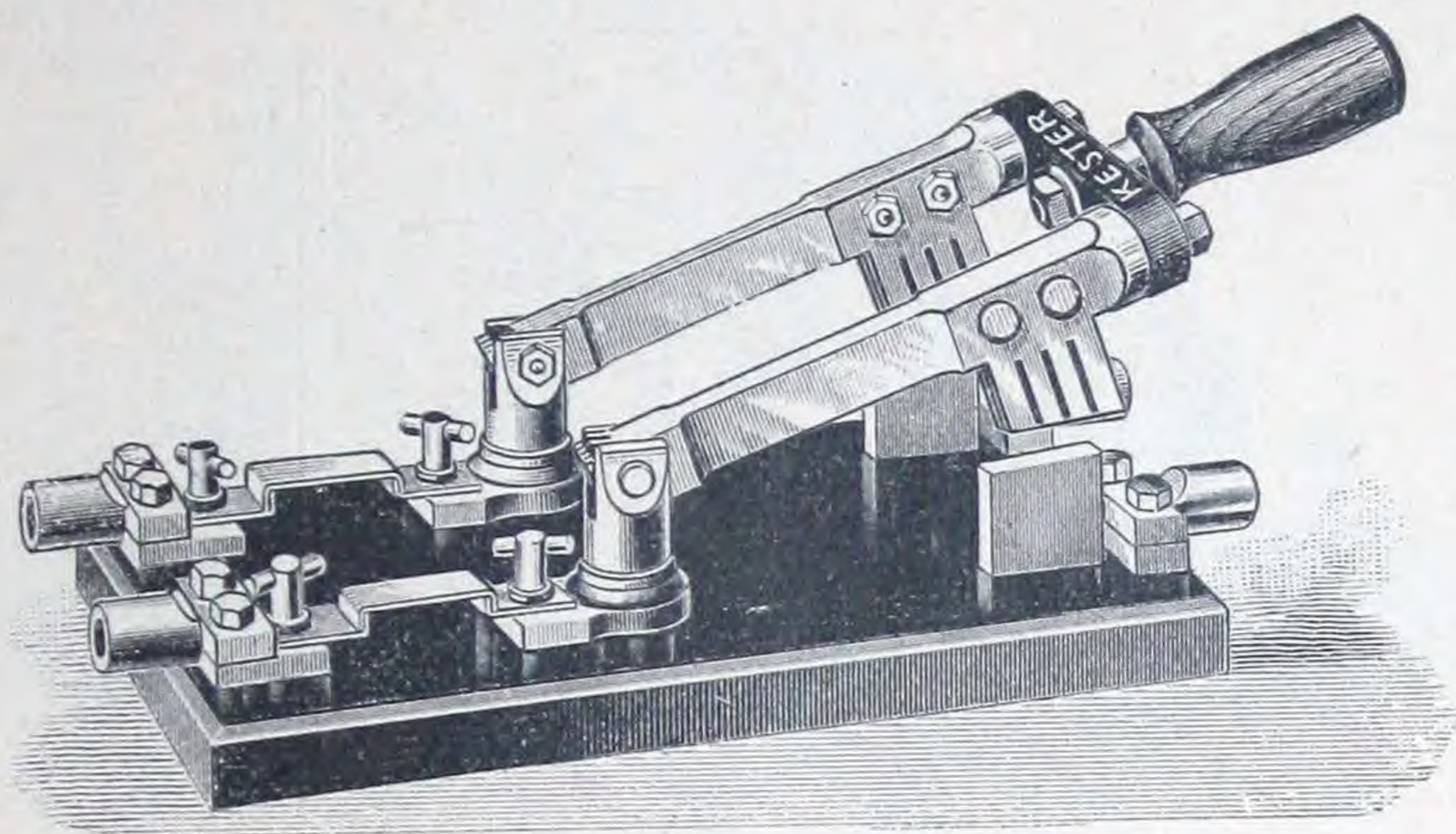
Capacity, Amp.	Trade Word.	List No.	Wood Base, Dipped.	Trade Word.	List No.	Wood Base, Polished.	Trade Word.	List No.	Slate Base, Polished.
300	Rawhide ..	497	\$20 00	Razeeing ..	3327	\$26 00	Reached ...	3775	\$28 75
600	Rawish .....	498	40 00	Reabsorb...	3328	50 00	Reaching ..	3776	53 50
1000	Rawness...	499	64 00	Reaccess...	3329	80 00	React .....	3777	84 00
2000	Razee .....	500	80 00	Reach.....	3330	90 00	Reacting ..	3778	95 50

LANG THROW OVER OR ALTERNATING SWITCH.

Capacity, Amp.	Style.	Trade Word.	List No.	Wood Base, Dipped.	Trade Word.	List No.	Wood Base, Polished.	Trade Word.	List No.	Slate Base, Polished.
150	Single Pole	Reaction ..	488	\$18 00	Reagent ...	3779	\$22 00	Reapply ...	3788	\$24 00
150	Double "	Reactor...	489	38 00	Realgar....	3780	44 00	Reappoint ..	3789	47 00
150	Three "	Readable ..	490	58 00	Realism ...	3781	66 00	Rear .....	3790	69 00
300	Single "	Reading ...	491	28 00	Realist....	3782	34 00	Rearing ...	3791	36 00
300	Double "	Readjourn.	492	74 00	Reality ...	3783	60 00	Reascend ...	3792	63 00
300	Three "	Readjust ..	493	80 00	Realize ...	3784	90 00	Reason ...	3793	93 00
600	Single "	Readmit ...	494	38 00	Ream .....	3785	44 00	Reasonable ..	3794	46 00
600	Double "	Readorn ...	495	74 00	Reap .....	3786	84 00	Reasoned ...	3795	87 00
600	Three "	Reaffirm...	496	100 00	Reaping ...	3787	120 00	Reassert ...	3796	123 00



## JACK KNIFE SWITCHES—Continued.



## SINGLE THROW.

Capacity, Amp.	Trade Word.	List No.	Single Pole.	Trade Word.	List No.	Double Pole.	Trade Word.	List No.	Triple Pole.
25 to 35	Reassign ..	3250	\$6 00	Reasty ----	3255	\$9 00	Rebato-----	3260	\$12 00
50 " 75	Reassume--	3251	9 00	Reate -----	3256	13 00	Rebec -----	3261	17 50
100 " 150	Reassure---	3252	11 00	Reattach --	3257	17 00	Rebel -----	3262	22 50
200 " 300	Reassured--	3253	13 00	Reattempt--	3258	19 50	Rebelled ---	3263	26 50
350 " 400	Reassurer -	3254	16 00	Rebate ----	3259	23 00	Rebelling--	3264	30 00

## DOUBLE THROW.

Capacity, Amp.	Trade Word.	List No.	Single Pole.	Trade Word.	List No.	Double Pole.	Trade Word.	List No.	Triple Pole.
25 to 35	Rebellion ..	3265	\$9 00	Reboil ----	3270	\$12 00	Rebuke ----	3275	\$18 00
50 " 75	Rebellious	3266	13 00	Rebound --	3271	17 50	Rebukeful -	3276	23 50
100 " 150	Rebellow --	3267	17 00	Rebrace ---	3272	22 50	Rebuker ---	3277	30 50
200 " 300	Reblossom--	3268	19 50	Rebuff ----	3273	26 50	Rebury ----	3278	35 50
350 " 400	Reboation -	3269	23 00	Rebuild ----	3274	30 00	Rebus -----	3279	40 00

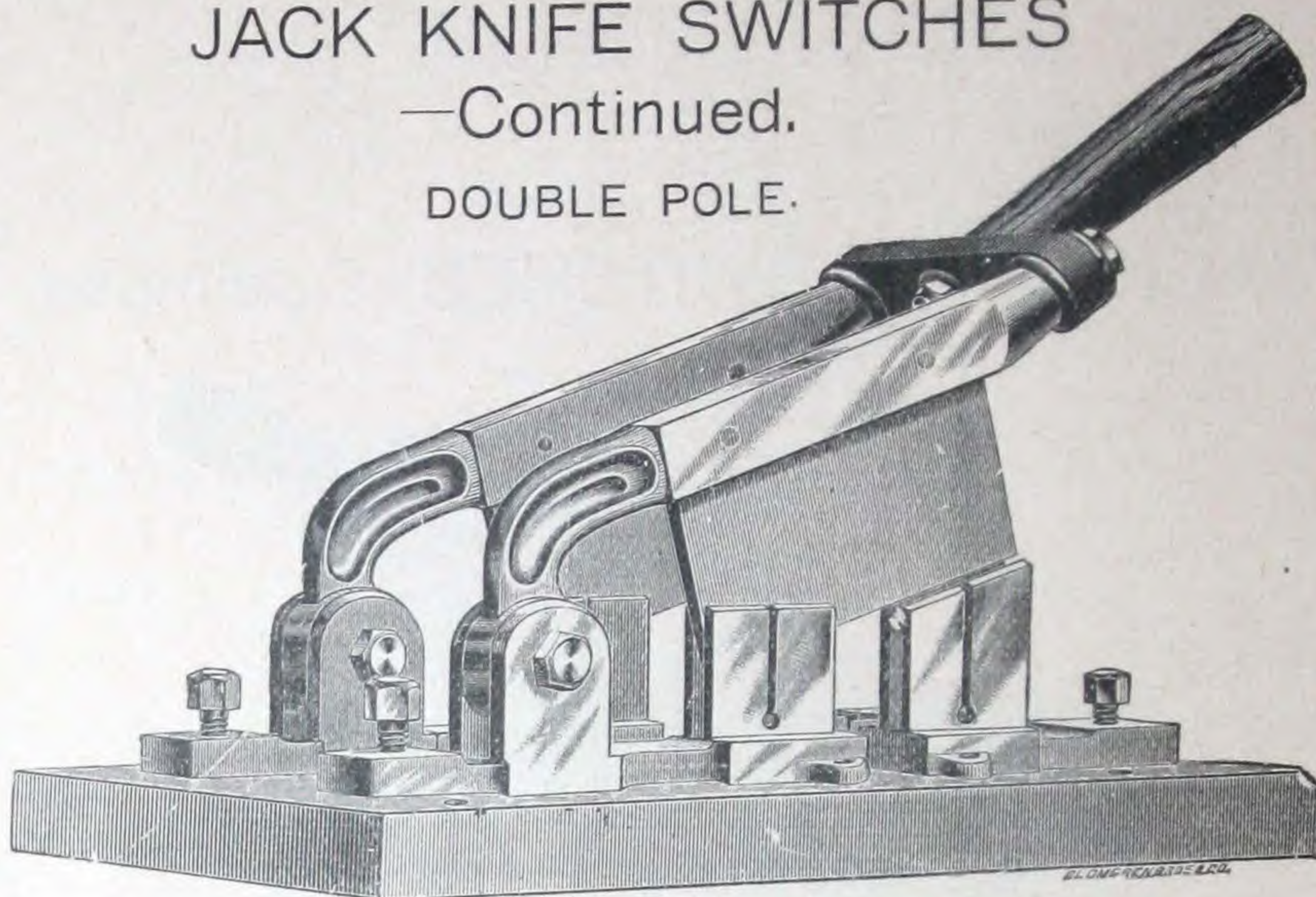
Switches fused and polished.



# JACK KNIFE SWITCHES

## —Continued.

### DOUBLE POLE.



Capacity, Amp.	Trade Word.	List No.	Wood Base, Dipped.	Trade Word.	List No.	Wood Base, Polished.	Trade Word.	List No.	Slate Base, Polished.
100	Rebutted...	467	\$20 00	Recaptor ..	3797	\$26 00	Receptory ..	3804	\$28 50
250	Recall.....	468	30 00	Recast ....	3798	36 00	Recess .....	3805	40 00
400	Recalling...	469	42 00	Recede ....	3799	48 00	Rechange...	3806	54 00
600	Recant ....	470	48 00	Receding ..	3800	60 00	Recharge ..	3807	64 00
1000	Recanted ..	471	64 00	Receiptor ..	3801	80 00	Recharter ..	3808	84 00
2000	Recanting ..	472	100 00	Recency ...	3802	120 00	Recheat....	3809	125 00
3000	Recaption ..	473	140 00	Reception..	3803	160 00	Rechoose ..	3810	168 00

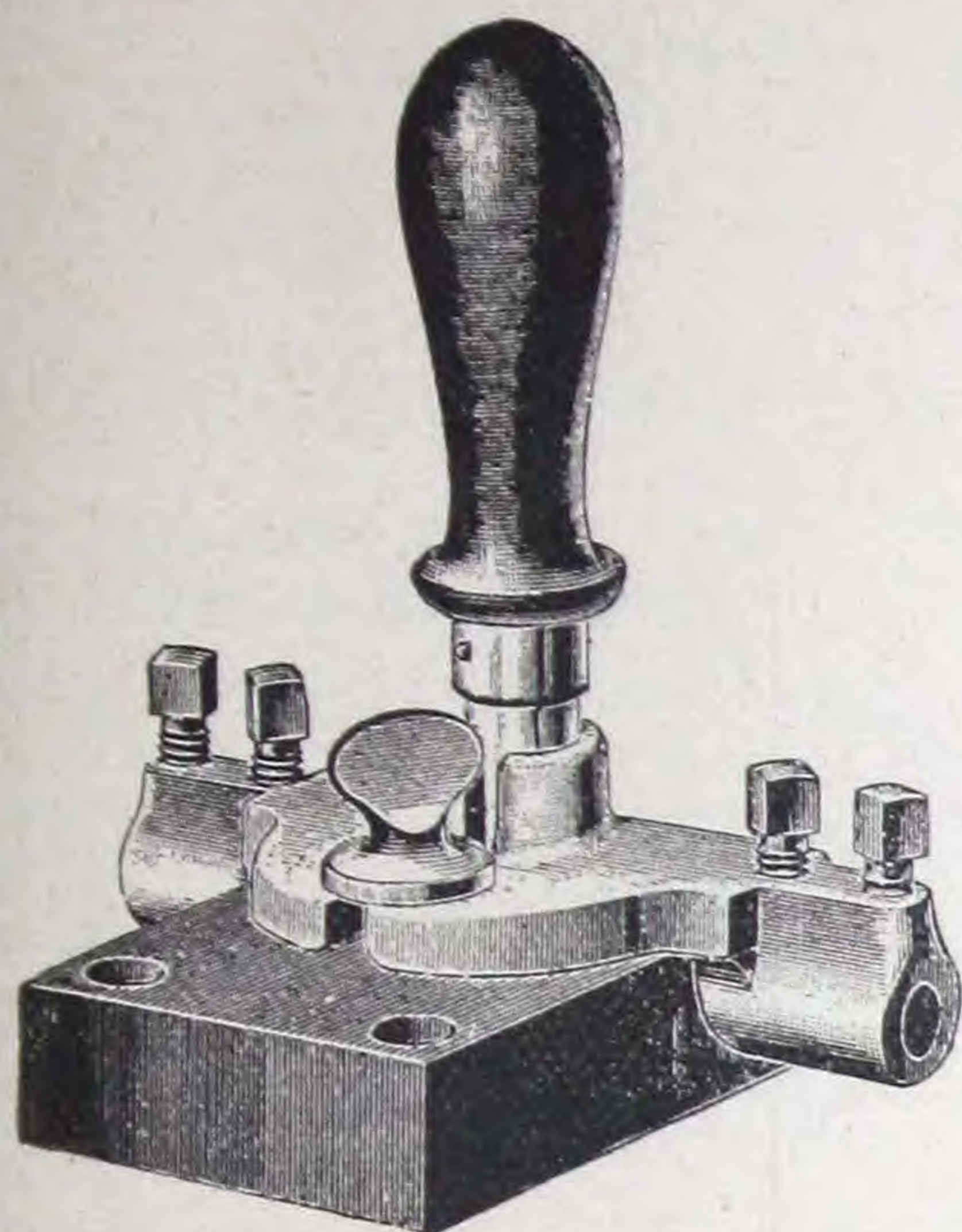
### THREE POLE SWITCHES.

Capacity, Amp.	Trade Word.	List No.	Wood Base, Dipped.	Trade Word.	List No.	Wood Base, Polished.	Trade Word.	List No.	Slate Base, Polished.
150	Recipient ..	474	\$30 00	Reckon ....	3811	\$40 00	Reclude ...	3817	\$45 00
250	Reciprocal ..	475	45 00	Reckoning..	3812	55 00	Recluse ....	3818	60 00
400	Recision ...	476	63 00	Reclaim ...	3813	73 00	Reclusion...	3819	80 00
600	Recital ....	477	72 00	Reclaimed ..	3814	90 00	Recoast ...	3820	96 00
1000	Recite.....	478	96 00	Recline ....	3815	120 00	Recoat .....	3821	126 00
2000	Recited ....	479	150 00	Reclining..	3816	180 00	Recognize ..	3822	186 00
3000	Reciting ...	480	210 00	Reclose ....	3816½	240 00	Recognizor	3822½	250 00

### FOUR POLE SWITCHES.

Capacity, Amp.	Trade Word.	List No.	Wood Base, Dipped.	Trade Word.	List No.	Wood Base, Polished.	Trade Word.	List No.	Slate Base, Polished.
150	Recoil.....	481	\$40 00	Recomfort ..	3823	\$52 00	Record .....	3830	\$55 00
250	Recoiling...	482	60 00	Recommend ..	3824	72 00	Recorder....	3831	75 00
400	Recoin .....	483	84 00	Recommit ...	3825	96 00	Recording ..	3822	102 00
600	Recoinage ..	484	96 00	Recompact ..	3826	120 00	Recouch ...	3833	126 00
1000	Recoining ..	485	128 00	Recompose ..	3827	160 00	Recount ...	3834	167 00
2000	Recollect ..	486	200 00	Reconcile ..	3828	240 00	Recoured ...	3835	247 00
3000	Recombine ..	487	280 00	Reconquer ..	3829	320 00	Recourse...	3836	328 00

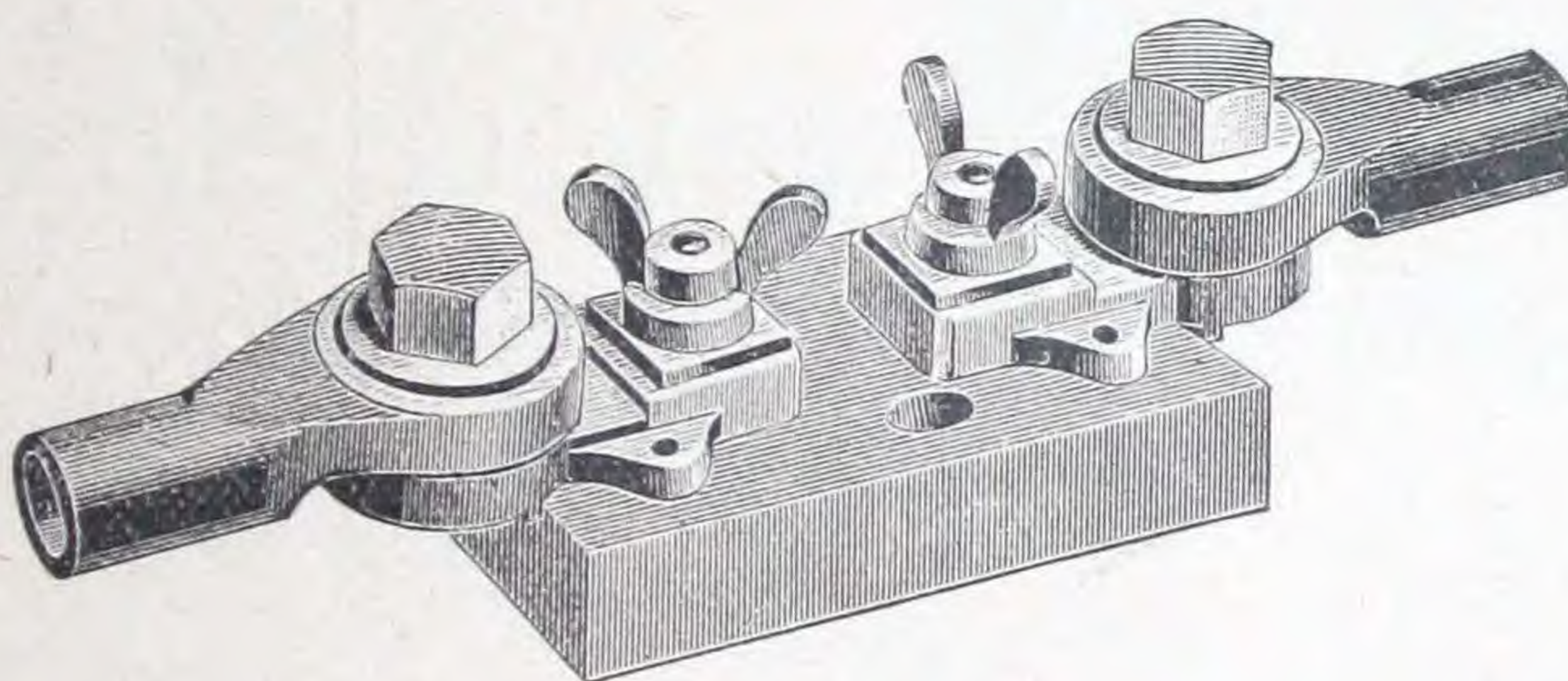




## PLUG SWITCH.

Trade Word.	List No.		Price Each.
Recover	654	Slate base, $\frac{5}{8}$ in. plug	\$3 00
Recoveror	655	Wood " $\frac{5}{8}$ " "	2 65
Recreant	656	Slate " $\frac{3}{4}$ " "	3 50
Recreate	657	Wood " $\frac{3}{4}$ " "	3 15

## FUSE HOLDERS.

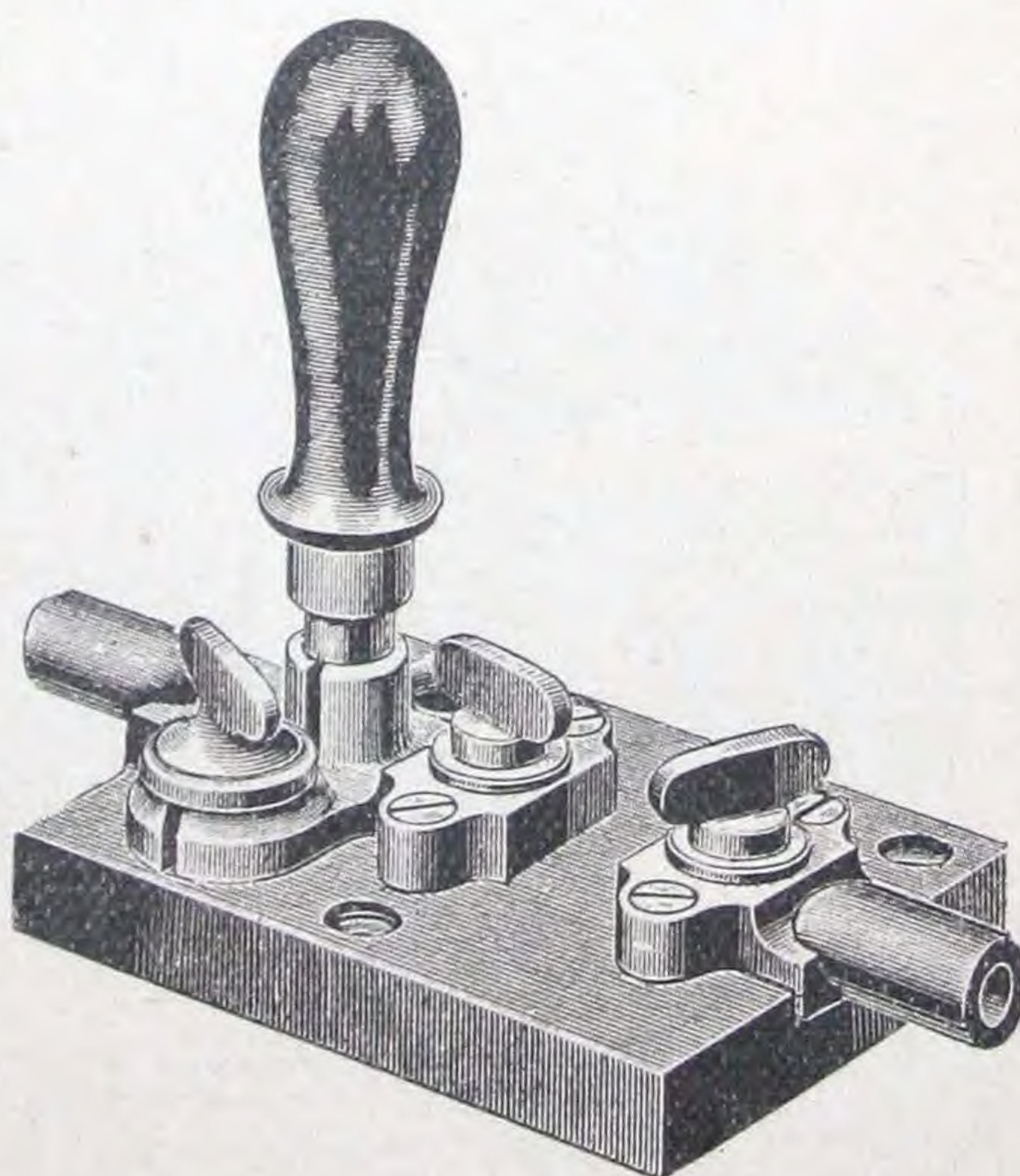


Trade Word.	List No.		Price.
Recreated	660	Slate base ----- each	\$2 80
Recrement	661	Wood " ----- "	2 50

## FUSE HOLDERS.

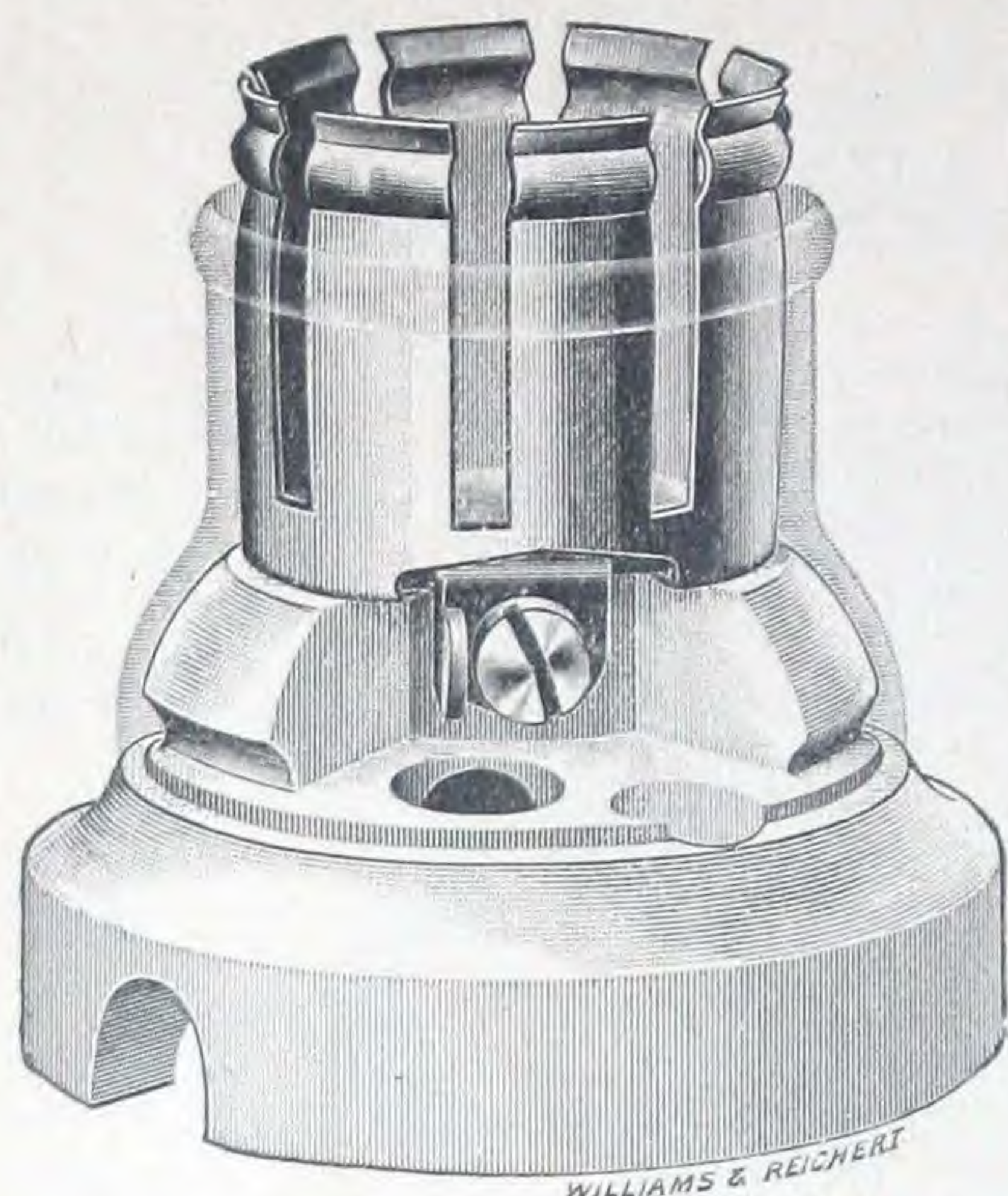
## FEEDER PLUG SWITCH AND FUSE HOLDER.

Trade Word.	List No.		Price Each.
Recross	658	Slate base, $\frac{5}{8}$ in. plug	\$6 00
Recrossing	659	Wood " $\frac{5}{8}$ " "	5 00





## SPECIAL CONCEALED RECEPTACLE.



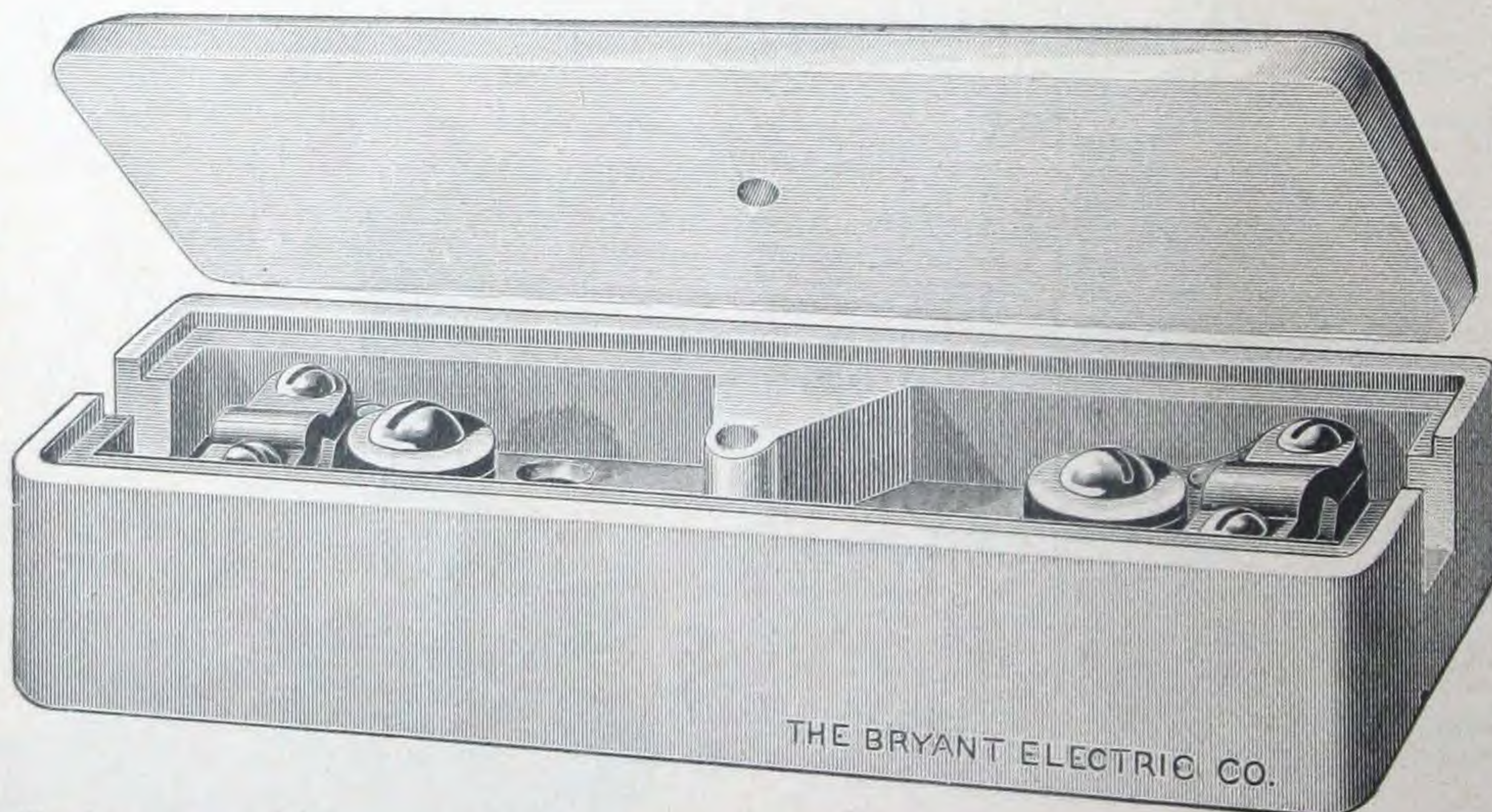
Made with brass shell and porcelain base for Edison, T.-H. or Westinghouse base lamps.

Trade Word.	List No.		Price Each.
Sanitary	3837	Edison concealed	\$0 45
Sanscrit	3838	T.-H. " "	45
Saporous	3839	Westinghouse concealed	45

## THE BRYANT 500-VOLT CUT-OUT.

WITH PORCELAIN COVER.

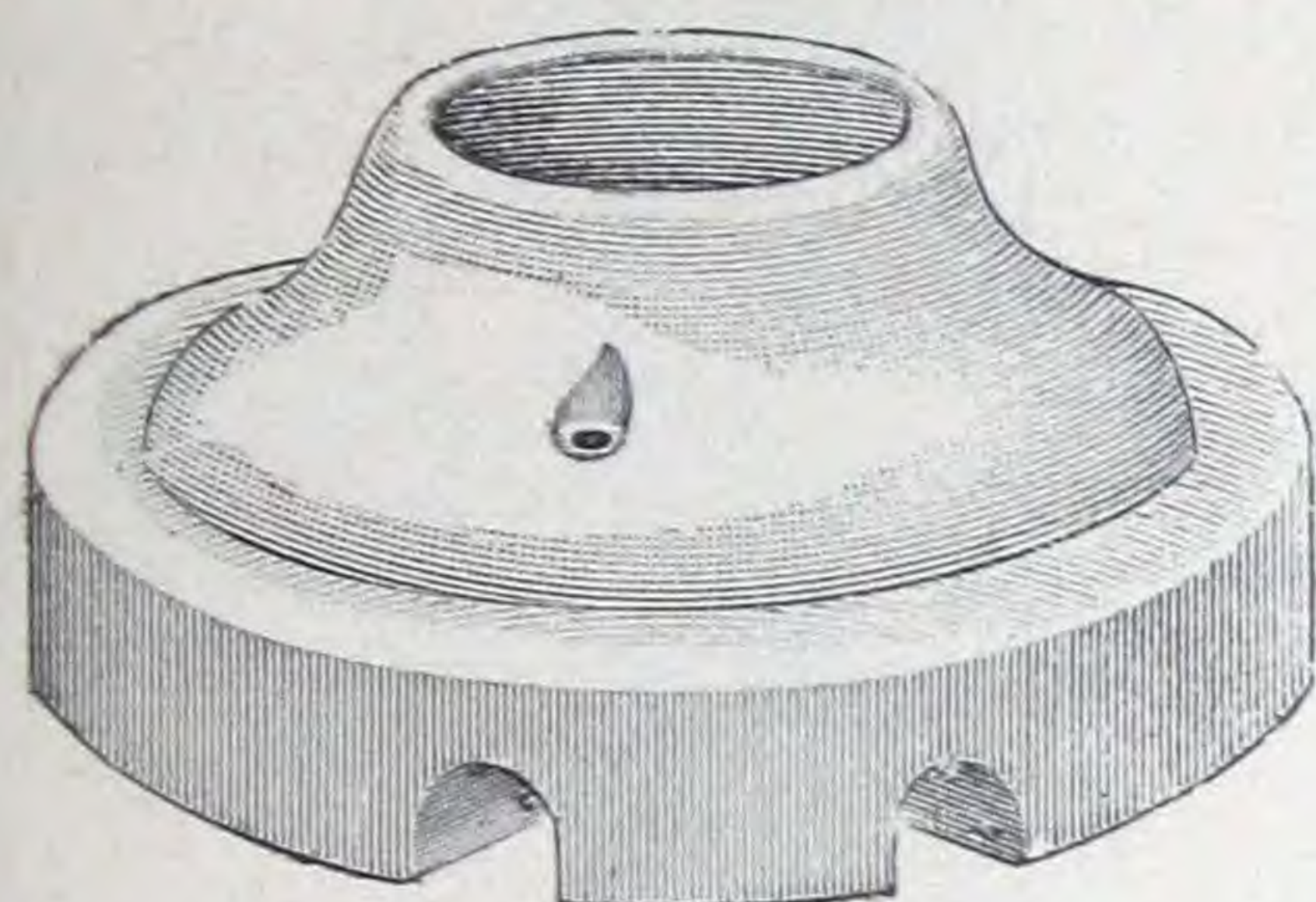
Made entirely of porcelain and metal. The distance between the terminals is sufficient to break an arc on 500 volts. An additional safeguard in the form of a bridge is interposed.



Trade Word.	List No.			Price.
Sapphic	3840	75 to 100 amperes	each	\$1 50
Sapphire	3841	25 to 50 " "	"	1 25
Sapsago	3842	1 to 25 " "	"	1 00



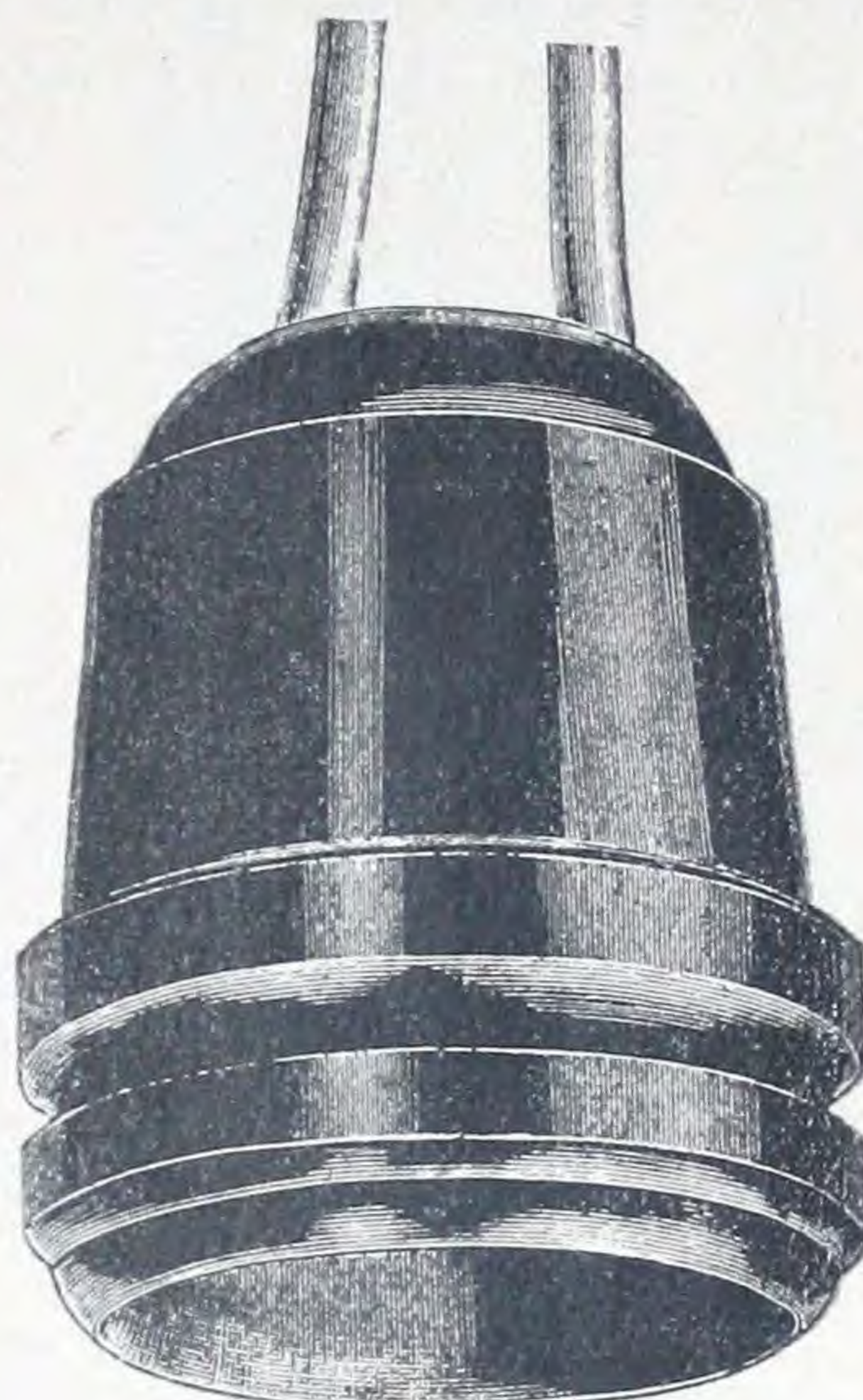
# PORCELAIN WALL RECEPTACLES.



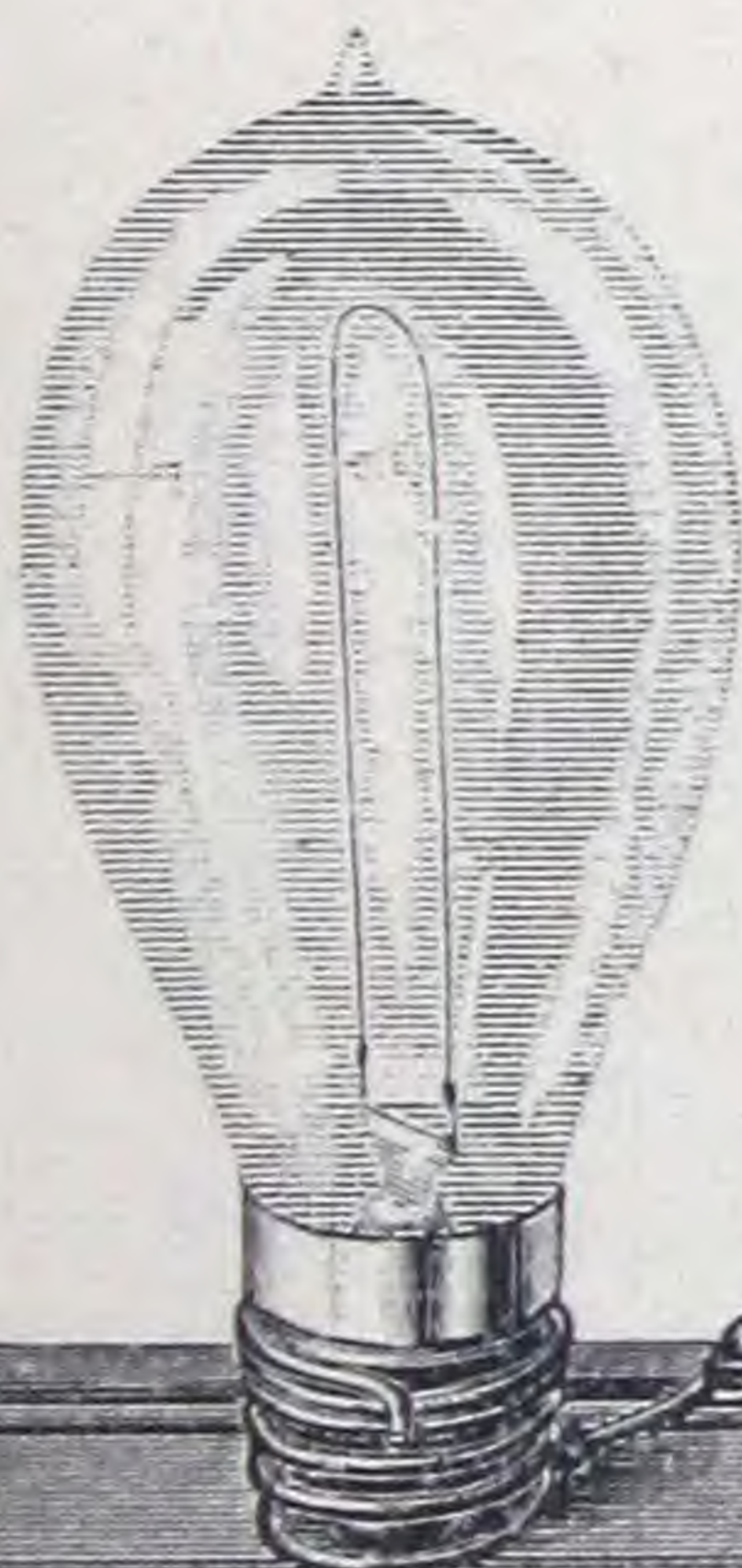
Trade Word.	List No.		Price Each.
Recruit	1447	T.-H. system	\$0 30
Recruiting	1448	West. "	30
Rectangle	1449	Edison "	30

# WATERPROOF SOCKETS.

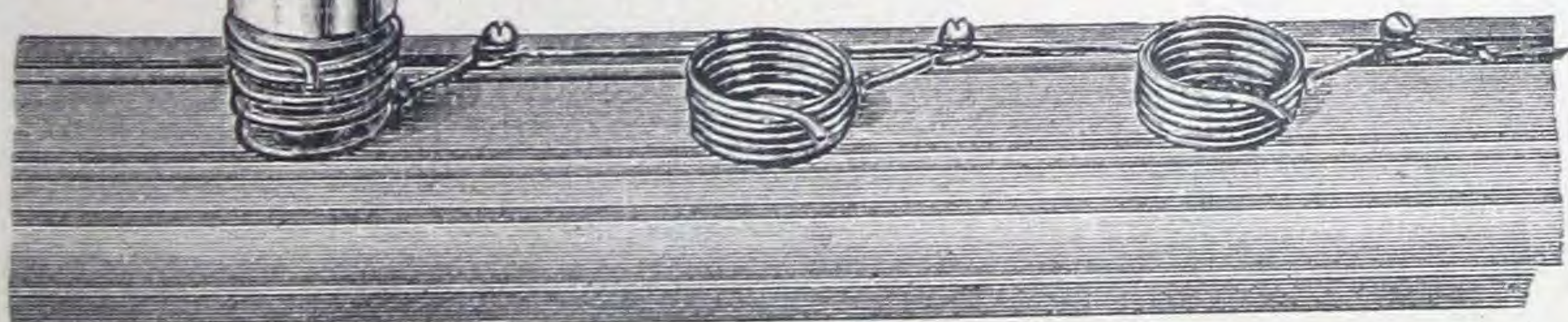
EDISON SYSTEM.



Trade Word.	List No.		Price.
Rectify	1454	Hard rubber each	\$0 50
Rectitude	1455	Mica T.-H. "	75
Rector	1456	" Edison "	75
Rectorate	1457	" West. "	75



# TEMPORARY SOCKETS.



Trade Word.	List No.		Price.
Rectrix	1459	For Edison system	each \$0 20
Recumb	1460	" West. "	20
Recumbent	1461	" T.-H. "	20



## SOCKETS.

DO YOU KNOW that we manufacture our own sockets? And in doing so we make the best socket in the market. The contact is double. No spiral springs. Positive and instantaneous make and break. Key turns either way and the handle does not burn off. It is very easy to wire up and no chance to short circuit should you desire to wire one up while current is on.

### PRICES.

#### KEY SOCKETS.

Trade Word.	List No.	System.		Price.
Recur	1434	Edison.....	each	\$0 50
Recure	1436	T.-H. ....	"	50
Recurve	1438	Westinghouse .....	"	50

#### KEYLESS SOCKETS.

Trade Word.	List No.	System.		Price.
Recusant	1435	Edison.....	each	\$0 45
Recuse	1437	T.-H. ....	"	45
Redact	1439	Westinghouse .....	"	45

#### KEY WALL SOCKETS.

##### PORCELAIN BASE.

Trade Word.	List No.	System.		Price.
Redan	1442	Edison.....	each	\$0 60
Redargue	1444	T.-H. ....	"	60
Redden	1440	Westinghouse .....	"	60

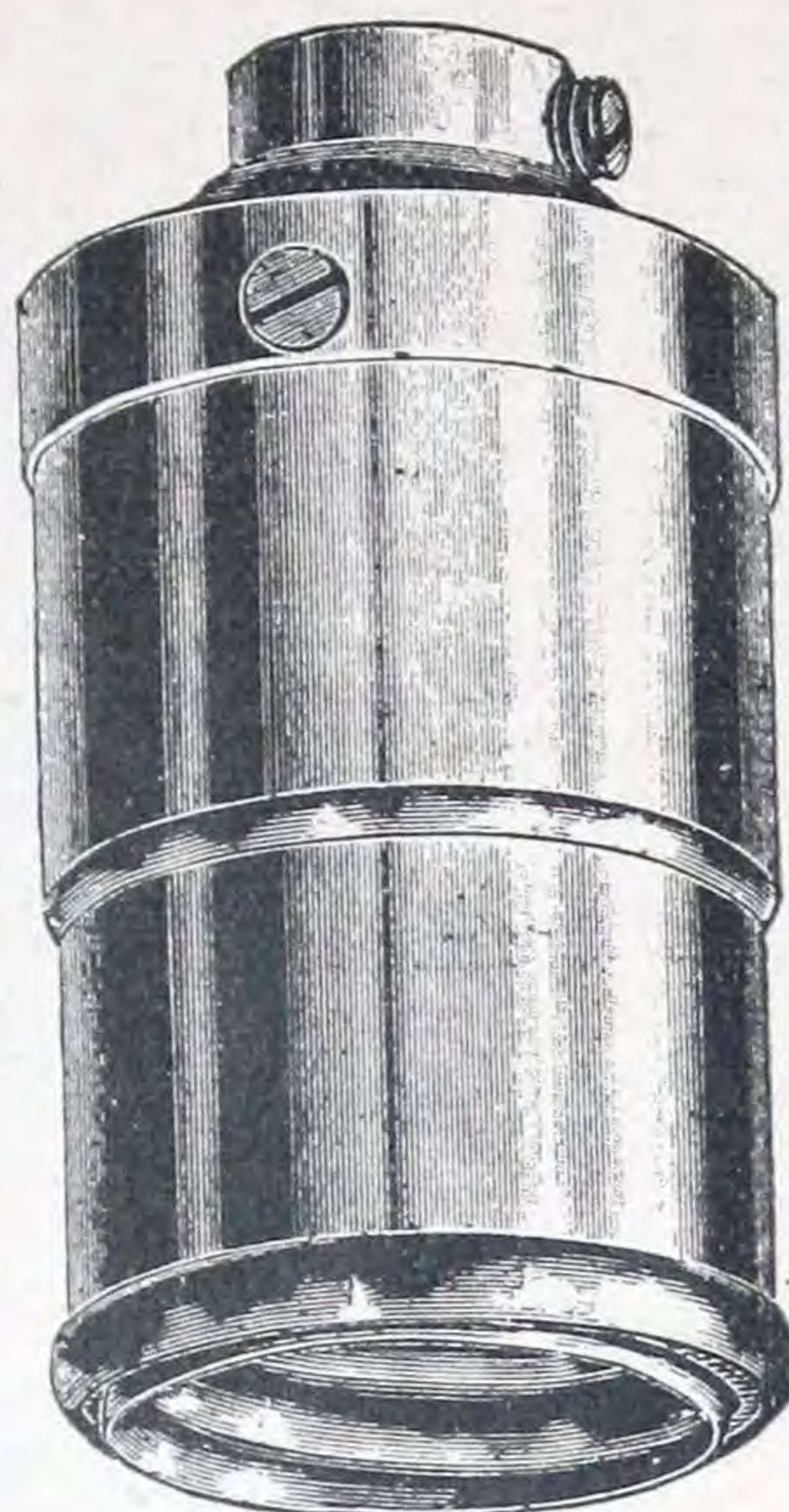
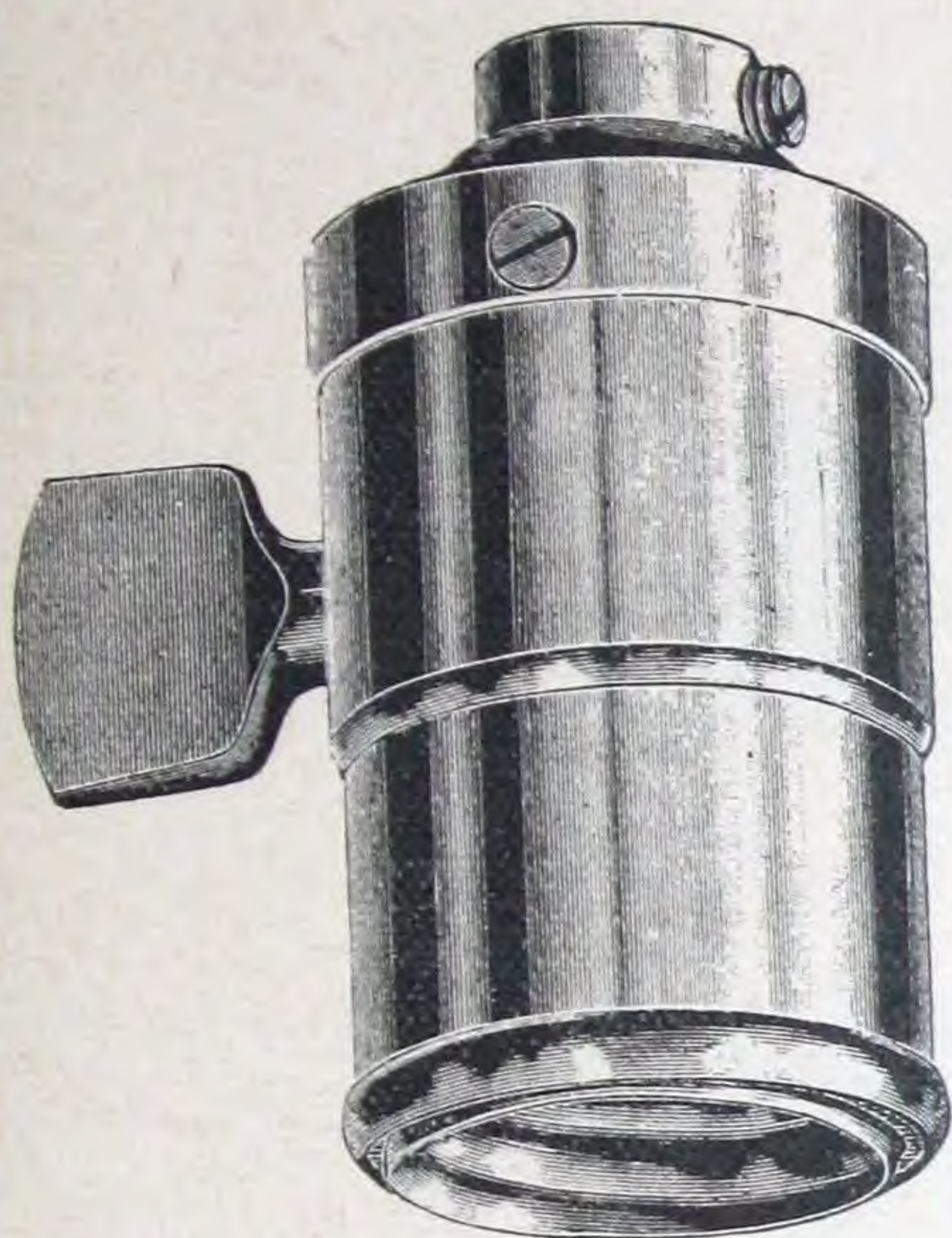
#### KEYLESS WALL SOCKETS.

##### PORCELAIN BASE.

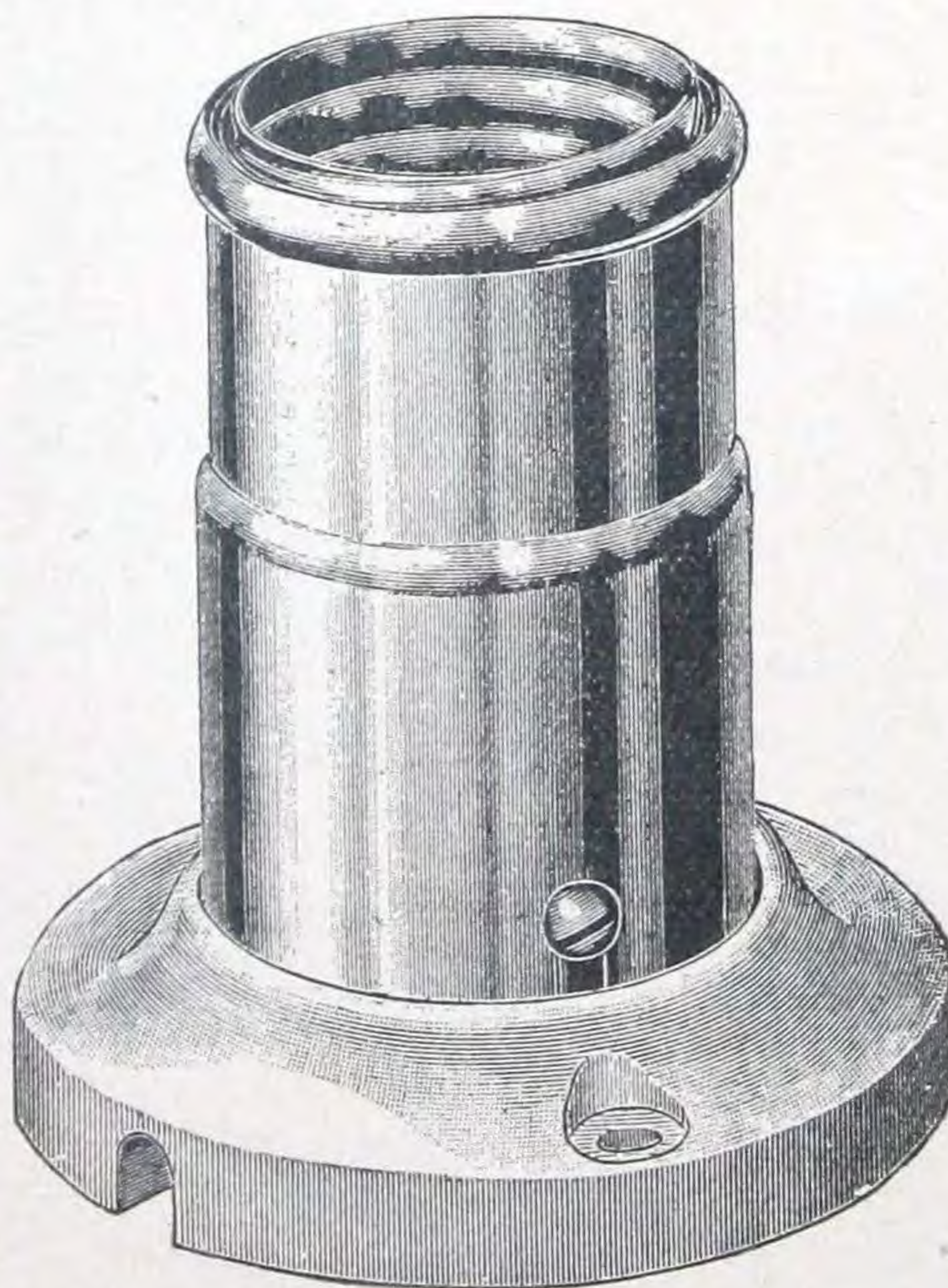
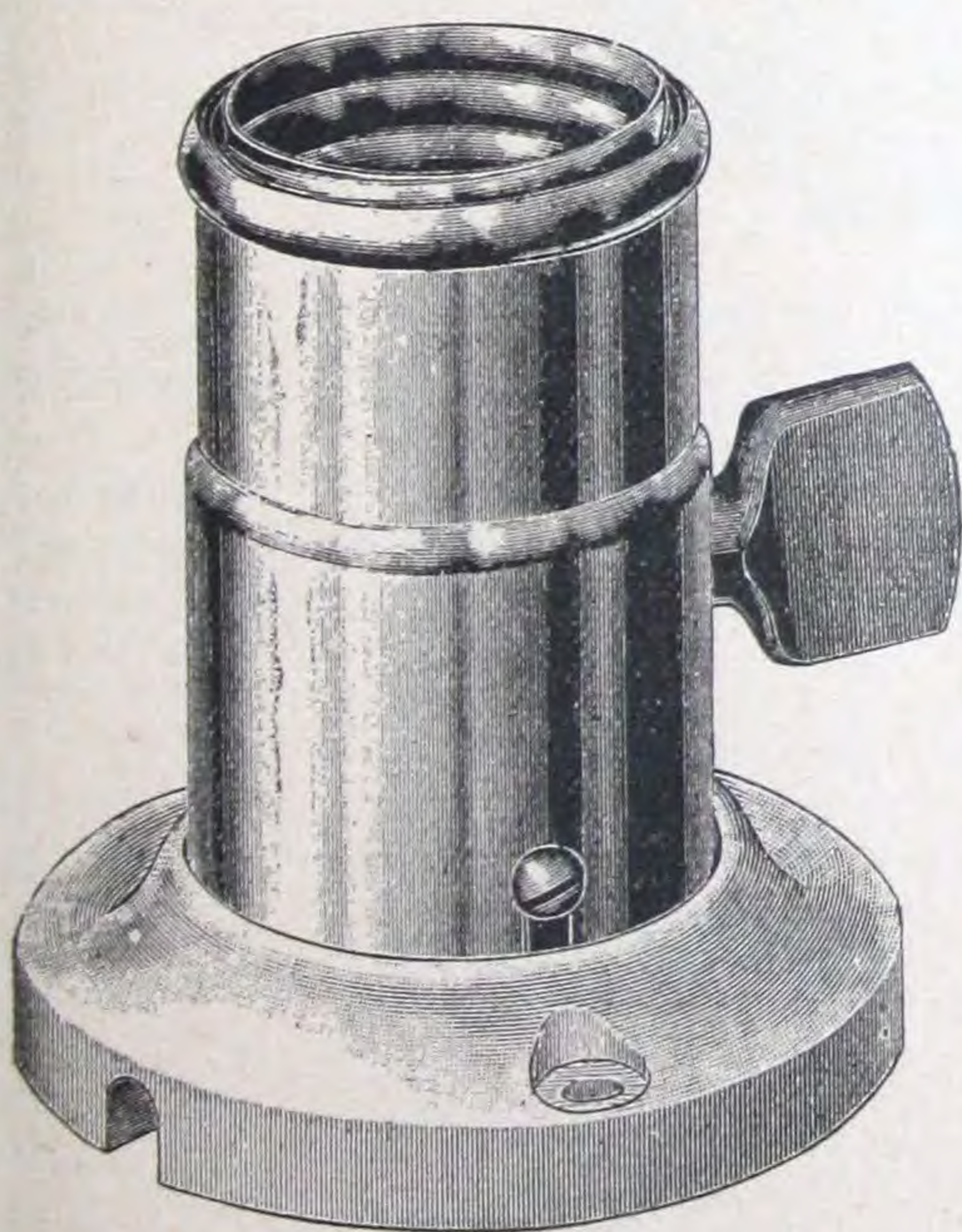
Trade Word.	List No.	System.		Price.
Reddle	1443	Edison.....	each	\$0 50
Redeemed	1445	T.-H. ....	"	50
Redeeming	1441	Westinghouse .....	"	50



## METROPOLITAN SOCKETS.



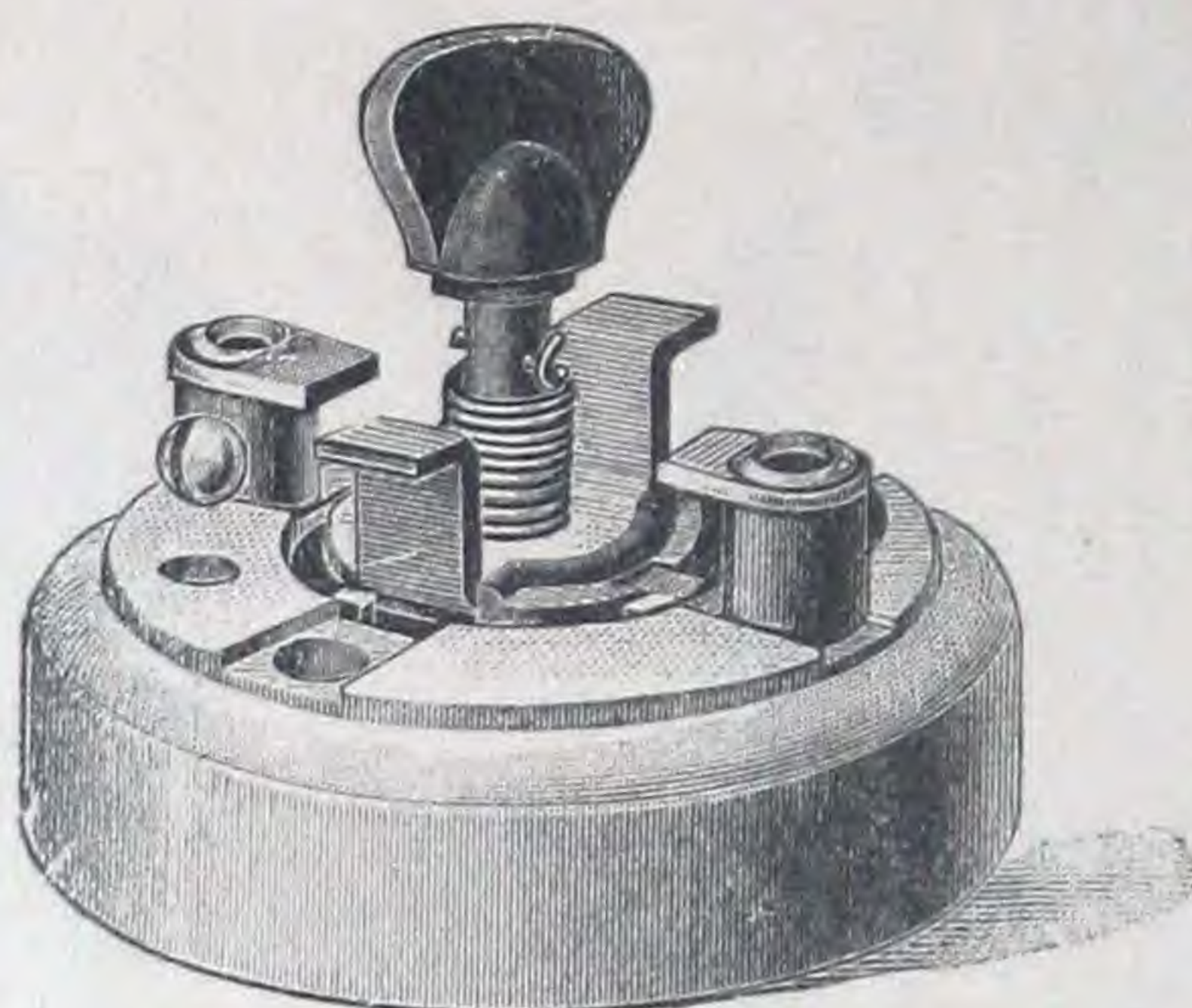
## METROPOLITAN WALL SOCKETS.



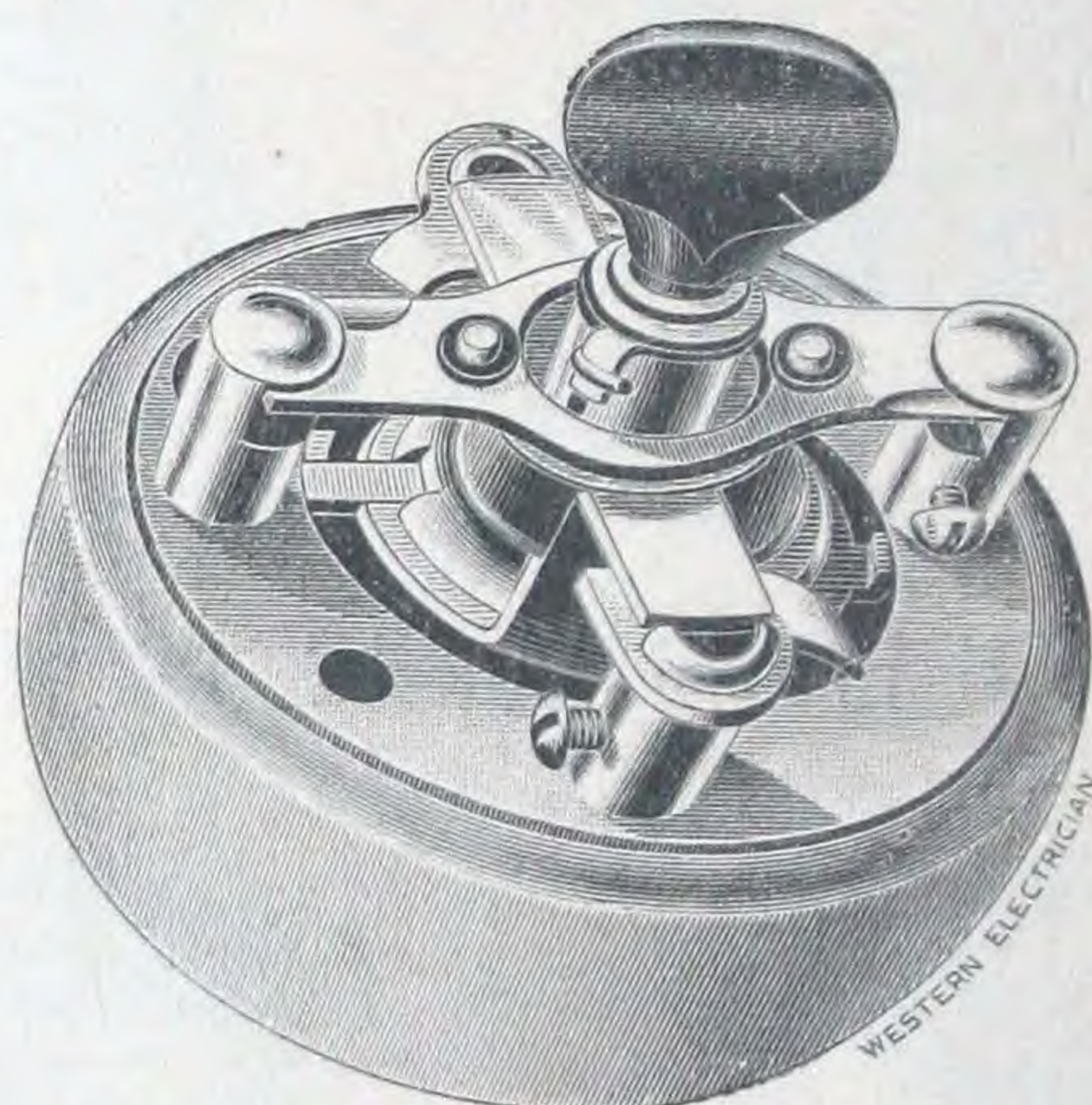


# "XNTRIC" SWITCHES.

## FIVE AMPERE SINGLE POLE.



## TEN AMPERE DOUBLE POLE.



The movement of this switch is founded on the well-known principle of the eccentric from which it gains its name. This movement is an absolutely positive one, one that cannot well get out of order.

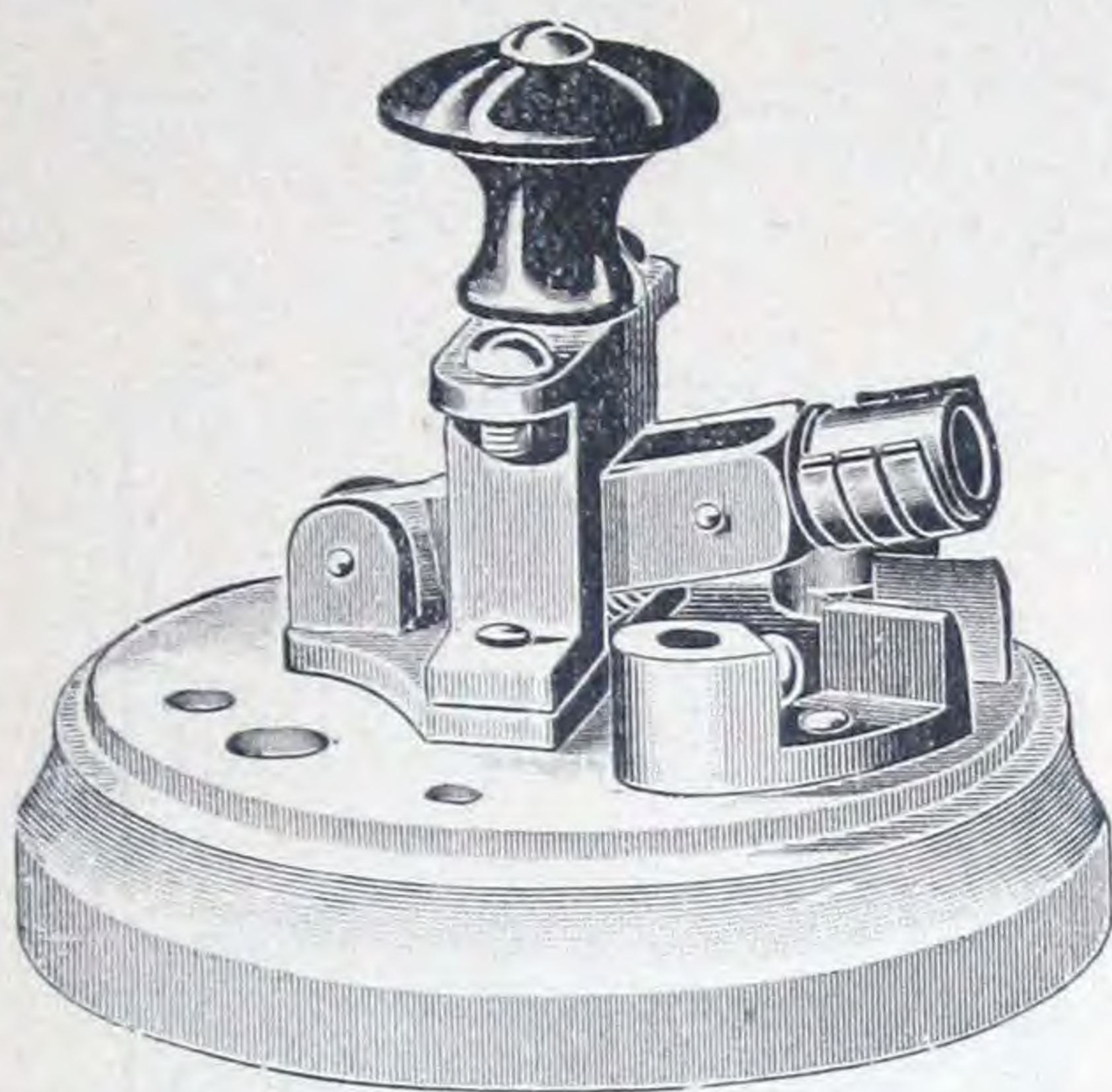
Contact surfaces are solid and the movement is such that they are clean before contact is made. The brass parts are attached to the porcelain base without the aid of screws. There being "no cushion" in porcelain, screws are apt to jar out when used in switches.

The switches are made in sizes as follows:

Trade Word.	List No.								Price.
Redeliver	1727	5 amperes single pole 500 volt						each	\$0 50
Redemand	1228	10 " " " " " "						"	75
Redemise	1229	10 " double " " " "						"	1 00
Redescend	1230	15 " " " " " "						"	1 50
Redient	1231	25 " " " " " "						"	2 30
Redigest	1232	40 " " " " " "						"	3 00
Redispose	1233	50 " " " " " "						"	4 00
Redisposing	1233½	10 " 3-way " " " "						"	90

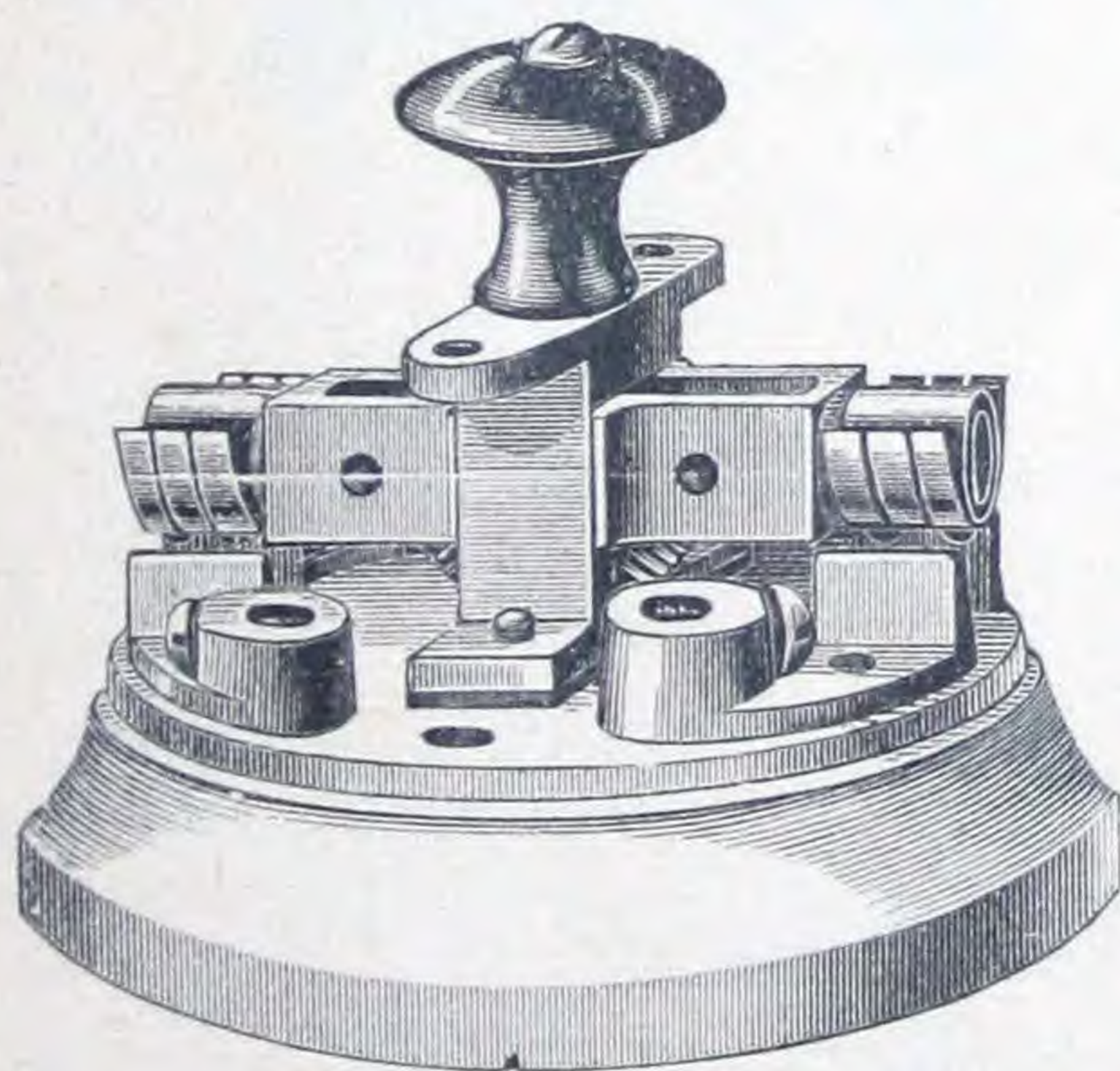


## THE BRYANT S. P. SWITCH.



Trade Word.	List No.		Price.
Redoubt	1221	Capacity 15 amperes ----- each	\$1 00
Redound	1222	“ 25 “ ----- “	1 20

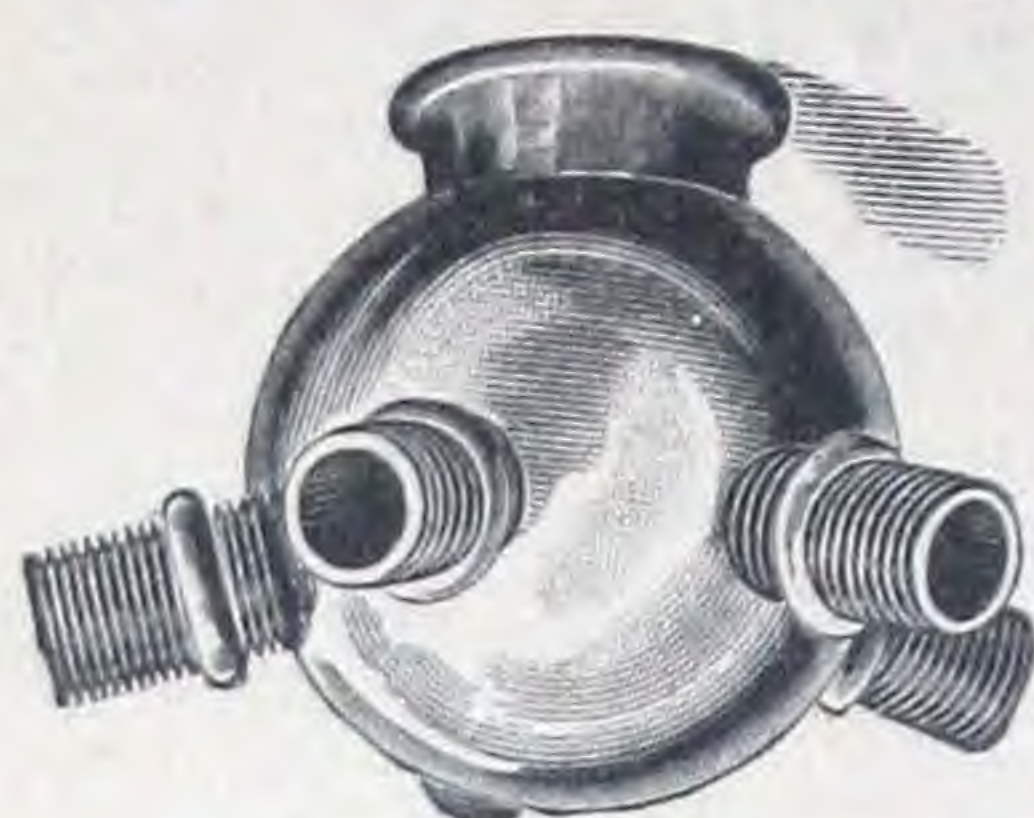
## THE BRYANT D. P. SWITCH.



Trade Word.	List No.		Price.
Redress	1223	Capacity 15 amperes ----- each	\$2 00
Redriven	1224	“ 25 “ ----- “	2 80
Redtop	1225	“ 40 “ ----- “	3 50
Reduced	1226	“ 50 “ ----- “	4 25



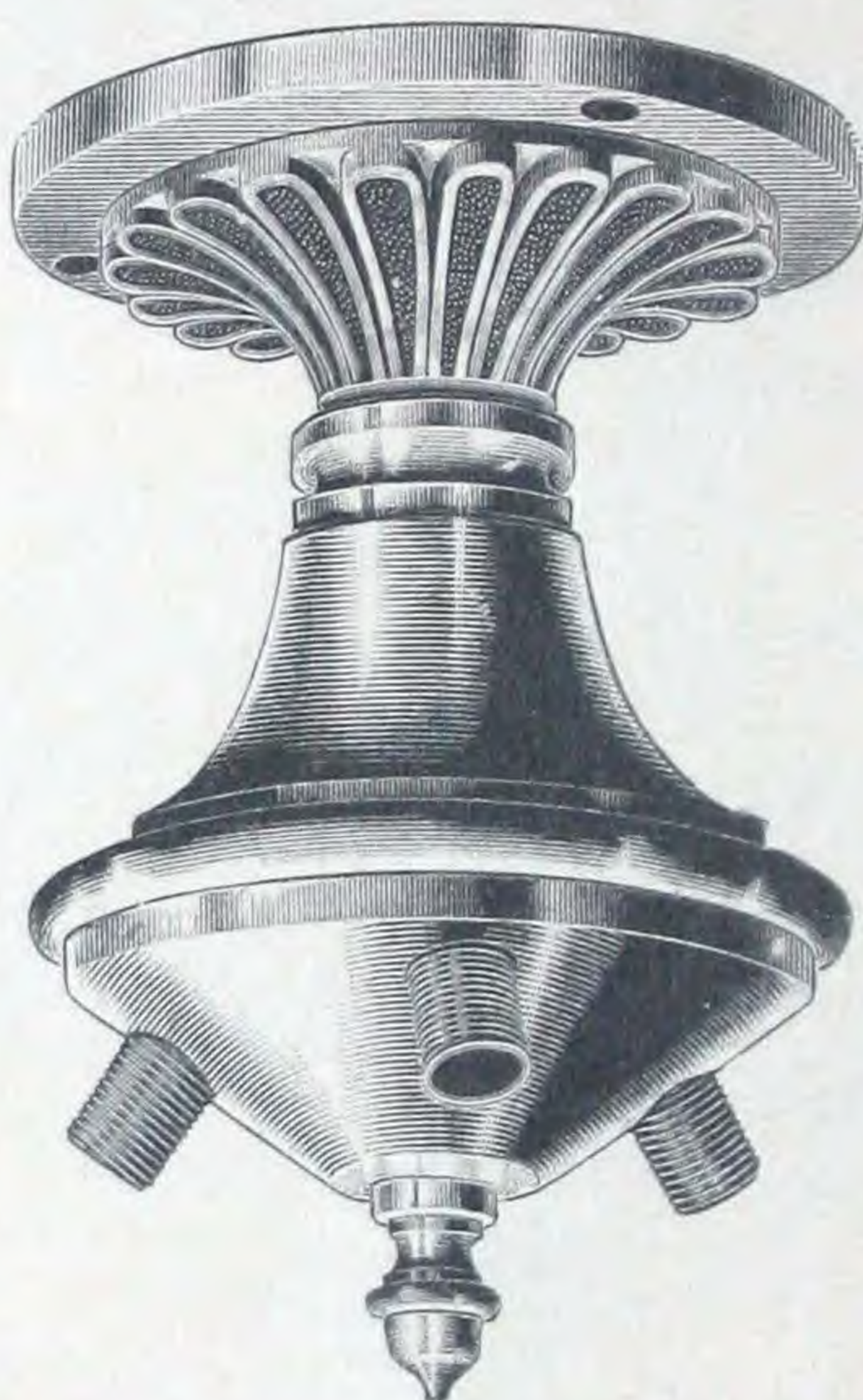
## BALL CLUSTER.



Trade Word.	List No.			Price.
Reducent	3843	2 lights	each	\$0 65
Reduct	3844	3 "	"	80
Reduction	3845	4 "	"	1 00
Reecho	3846	5 "	"	1 30
Reedy	3847	6 "	"	1 50

Tapped for  $\frac{1}{4}$ ,  $\frac{3}{8}$  and  $\frac{1}{2}$  inch iron pipe.

## BELL CLUSTER.



Trade Word.	List No.			Price.
Reef	3848	2 lights, polished brass	each	\$0 90
Reefband	3849	3 " " " "	"	1 00
Reefing	3850	4 " " " "	"	1 10
Reek	3851	5 " " " "	"	1 20
Reeking	3852	6 " " " "	"	1 30

Tapped for  $\frac{3}{8}$  inch iron pipe. Removable cap for wiring.

## WITH FLANGE.

Trade Word.	List No.			Price.
Reel	3853	2 lights, polished brass, with flange	each	\$1 40
Reelect	3554	3 " " " " " "	"	1 50
Reelectd	3855	4 " " " " " "	"	1 60
Reembark	3856	5 " " " " " "	"	1 70
Reembody	3857	6 " " " " " "	"	1 80
Reemerge	3858	Flange only	"	50

Flange fancy cast brass, 3 inch diameter,  $\frac{3}{8}$  inch iron pipe.



# THE GARTON STREET RAILWAY LIGHT- NING ARRESTER.



This arrester has been subjected to the most severe trials and tests and these tests have been made with lightning, and not in the laboratory alone, and the record it has made for itself, is never having failed.

These tests have been made under all circumstances and conditions, both favorable and unfavorable, and the same results have been obtained.

A new and improved feature of this arrester is the air or discharge gap, in multiple with the coil or solenoid, which can also be substituted with a resistance. The purpose of this resistance or air gap, is that the discharge may have the preference of two paths, should the inductive effect of the coil (if such can exist before the passage of the discharge) hinder its passage through the coil or solenoid. The other features of our improved and latest types, are the valves or outlets to the chamber, which will be described hereafter.

This arrester is very quiet, and makes no objectionable fire or smoke, and is instantaneous in action.

The arrester is first installed in a perpendicular position, it can be made to work out of plumb, 45 to 60 degrees if necessary, and jarring and moving does not interfere with its perfect operation. The arrester after having been put into position, a wire is then run from the trolley or feeder, whichever it may be, to the side binding post marked line; a wire is then brought from the ground

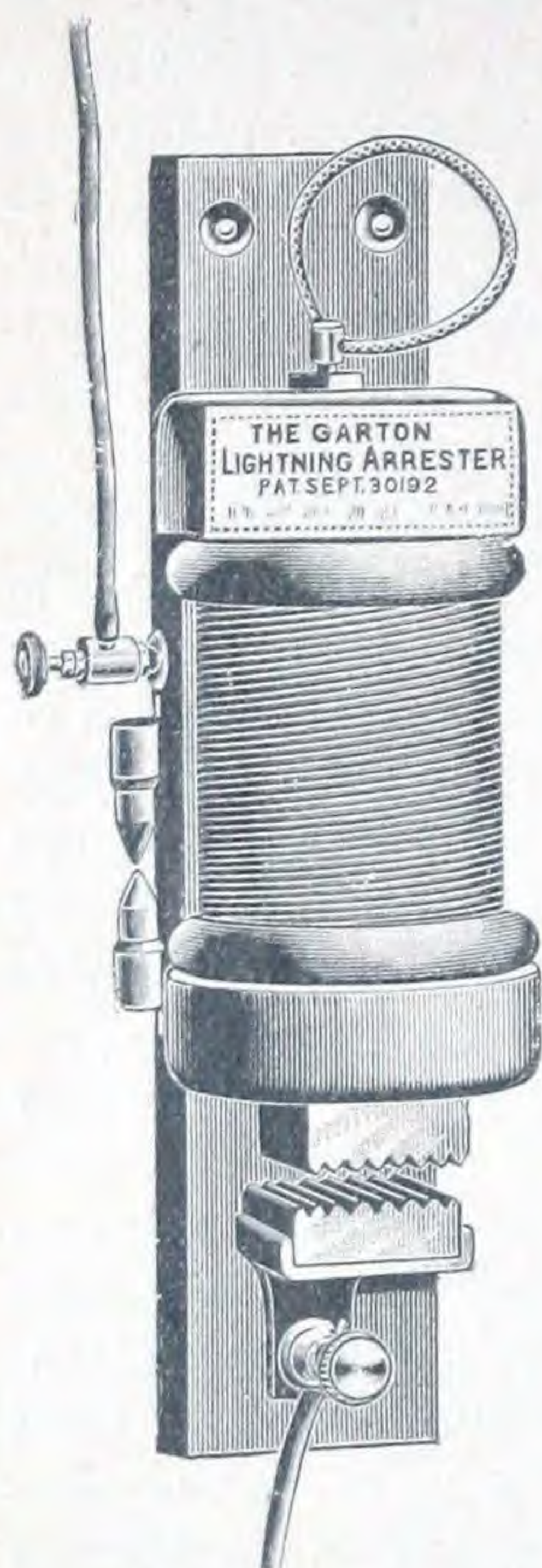
to the bottom binding post, which also holds the bracket in place, and is marked ground. There then exists but a small air gap between the trolley feeder and the ground, and quite a difference of potential at the air gap. Now suppose a discharge takes place, it of course, after striking the line, seeks the most direct outlet to the earth, which would be through the arrester. (This is not guess work, but it is a fact, as has been proven by the tests made.)

When it enters the arrester it has the preference of two paths, through the solenoid, or the air gap or resistance, which is in multiple with solenoid, thence through the flexible cord to the guide rod and armature, which consists of a brass rod screwed into an iron rod of larger diameter than the brass rod. The armature resting on the top plate, it leaps the air space to the bottom plate and into the earth. This of course establishes an arc between the carbons by the following of the dynamo current. This arc is instantaneously broken by the action of the arrester.

Trade Word.	List No.	Price.
Reeming	1157	each \$20 00



## THE GARTON METALLIC CIRCUIT LIGHTNING ARRESTER.



Trade Word.	List No.	Price.
Reenact	1158	----- each \$12 00

Above we illustrate The Garton Metallic Lightning Arrester, which can be used upon any metallic circuit from 50 to 2000 volts and from  $2\frac{1}{2}$  to 2000 amperes, including arc, direct, alternating and power circuits.

They are applied as follows:

On constant current circuits for protection of station, line and arc lamps.

On constant potential circuits for protection of station, line and transformers.

In protecting arc lamps and line on constant current circuits, arresters are placed singly at different points on the line, or at each lamp.

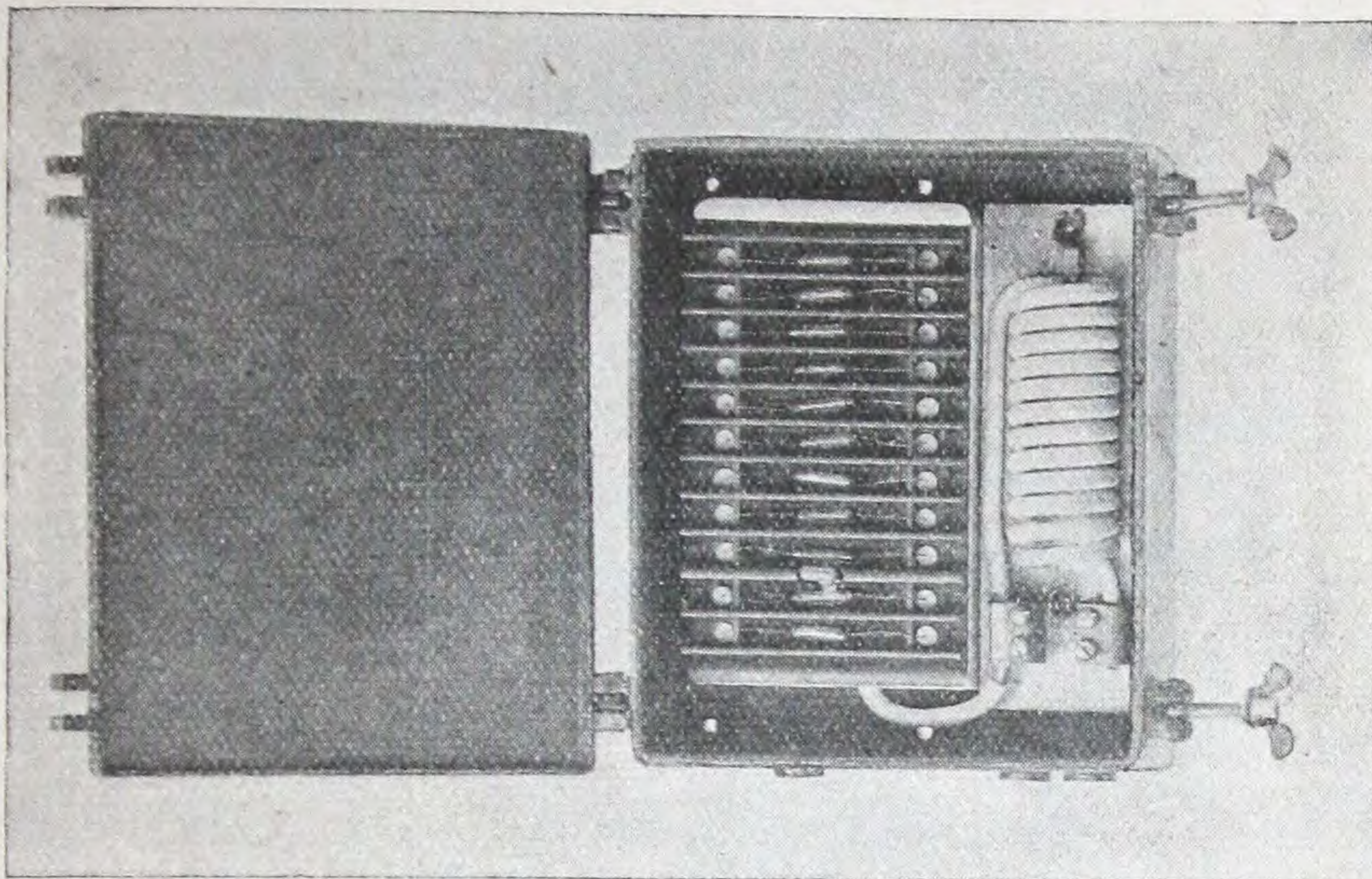
In the protection of transformers and line of constant potential circuits, arresters must be placed on each side of circuit and preferably near transformers.

For station protection an arrester should be used at the switch-board on each leading in, and leading out wire. This applies to both electric light and power stations.

To fill orders it is necessary that we know the system, whether intended for arc, direct, alternating or power circuits, the voltage and ampereage, and if to be used in station or on line.



## LIGHTNING ARRESTER.



A lightning arrester, to be effective, must fulfill efficiently the following requirements: It must afford an "easier path" for the discharge directly to ground than through the motor circuit. It must stop the arc immediately after the discharge and must at once automatically adjust itself for a new discharge. The arrester used in this system has stood the test of practical use and been proved perfect in all these respects.

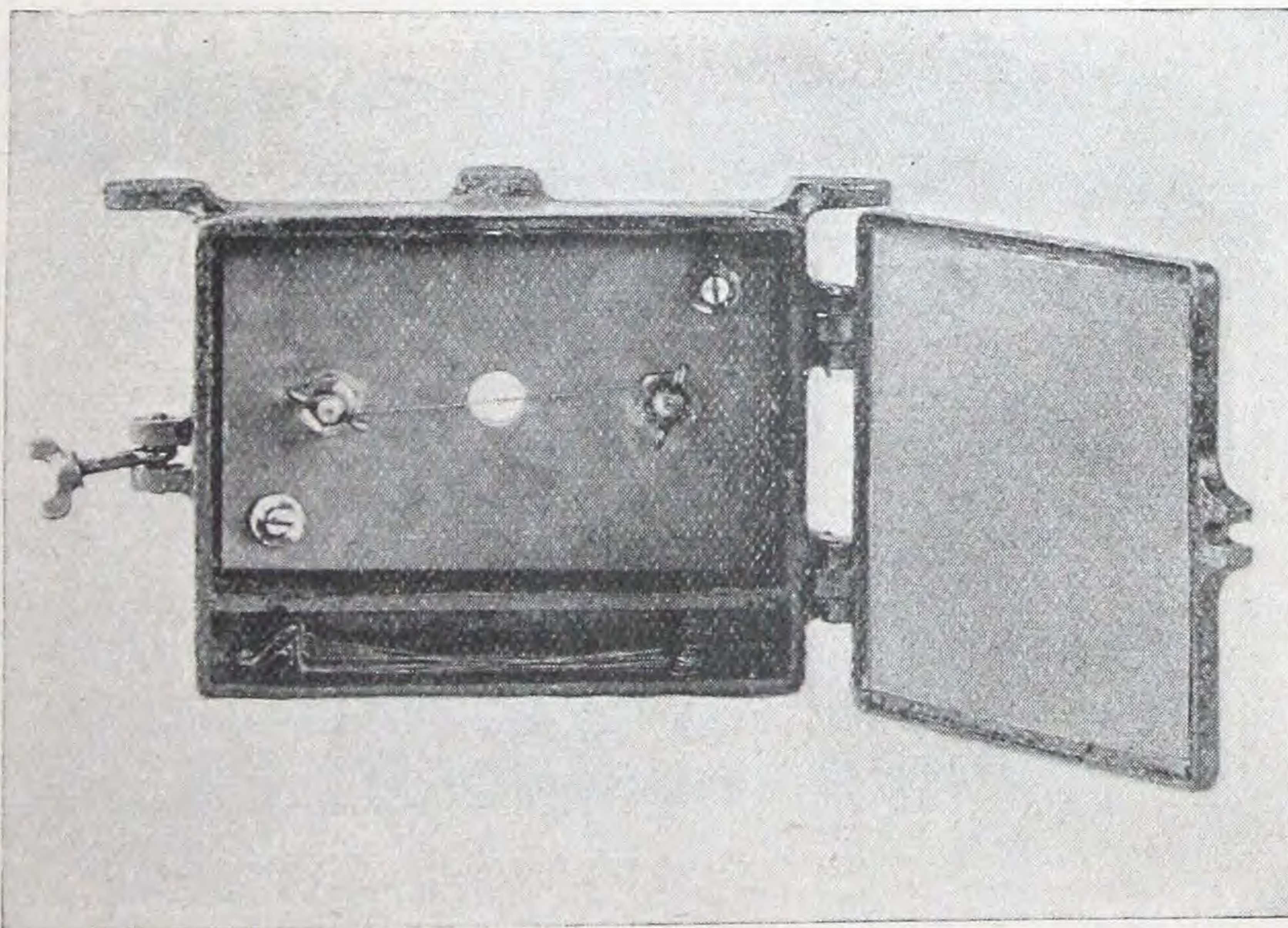
Trade Word. List No.

Reenacted 3280

Price.

each \$32 00

## FUSE BLOCK.



This is made of iron, slate and asbestos and is of a novel design. The fuse is a simple copper wire. It is placed upon the slate back of an iron box which is entirely closed, with the exception of a hole in the slate before which the fuse wire passes. The rush of the heated air through this hole when the fuse is "blown" effectually blows out the arc. A pocket at the bottom of the box inside the door is provided for carrying extra fuses.

Trade Word. List No.

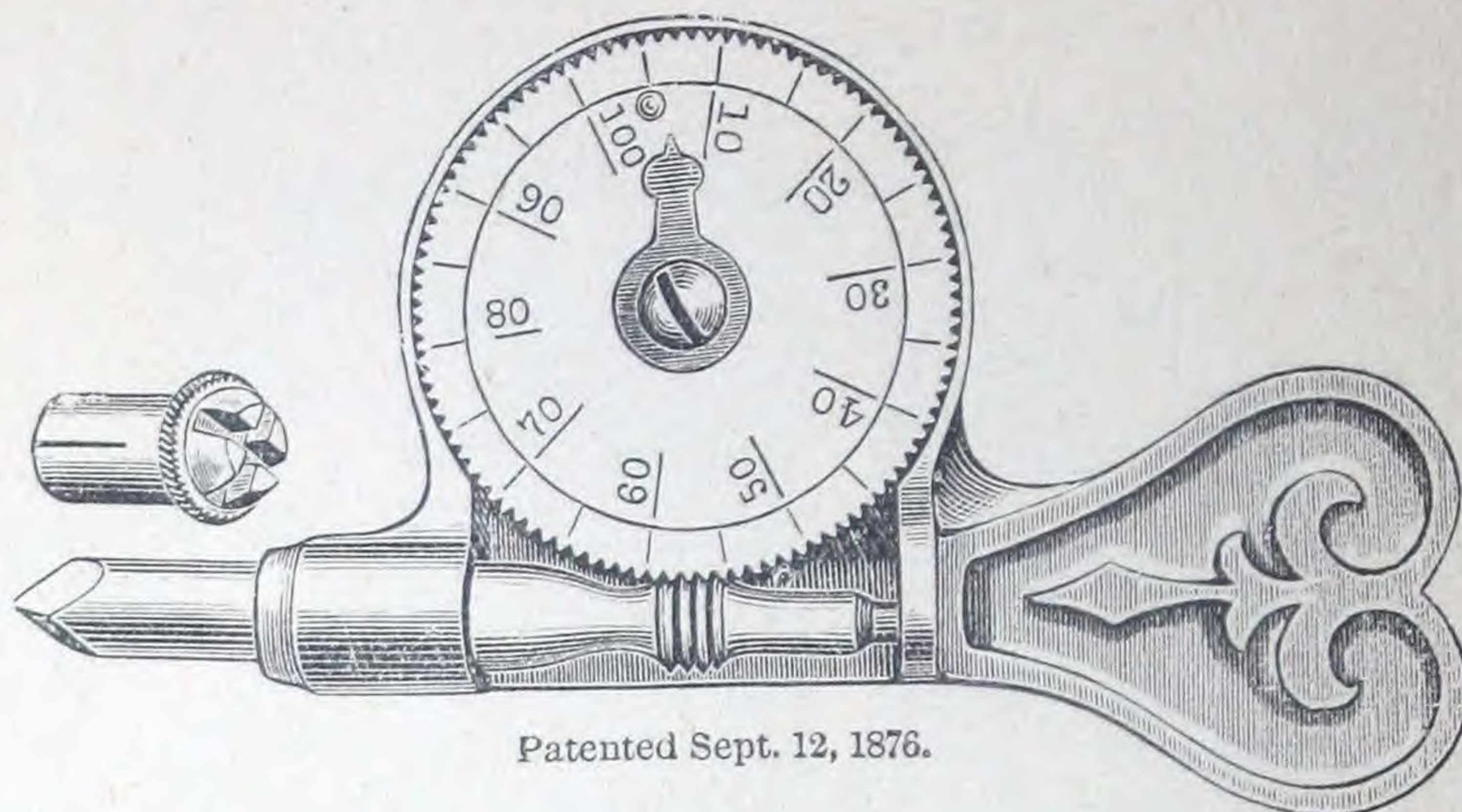
Reenforce 3281

Price.

each \$11 00



## COMMON SPEED INDICATOR.



Patented Sept. 12, 1876.

Trade Word.	List No.		Price.
Reengage	3247	Split cap, adapted to either pointed or hollow centers -----	each \$1 25
Reenjoy	3248	Plain cap, for hollow centers only -----	“ 1 00

## PARAGON SPEED INDICATOR.

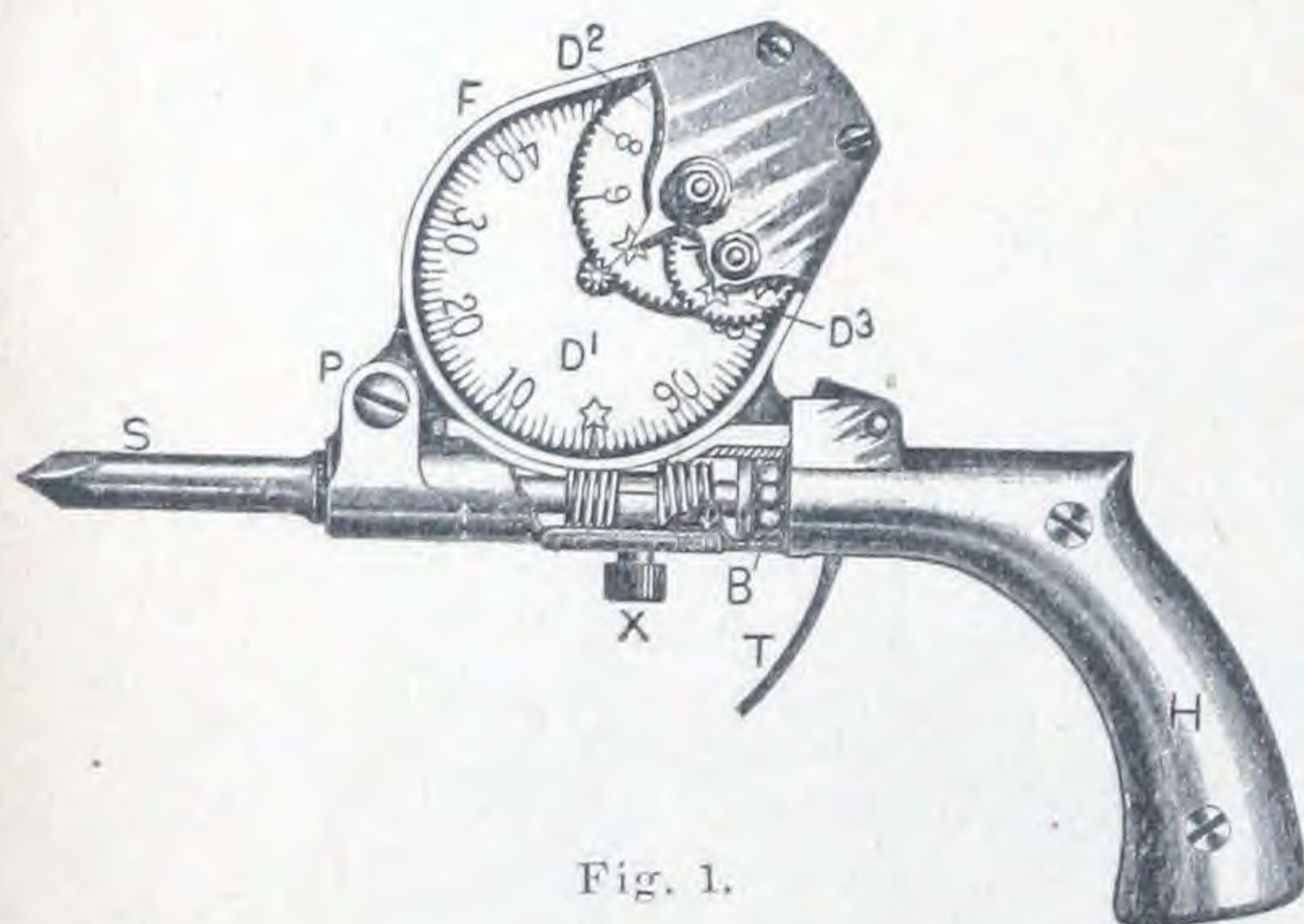


Fig. 1.

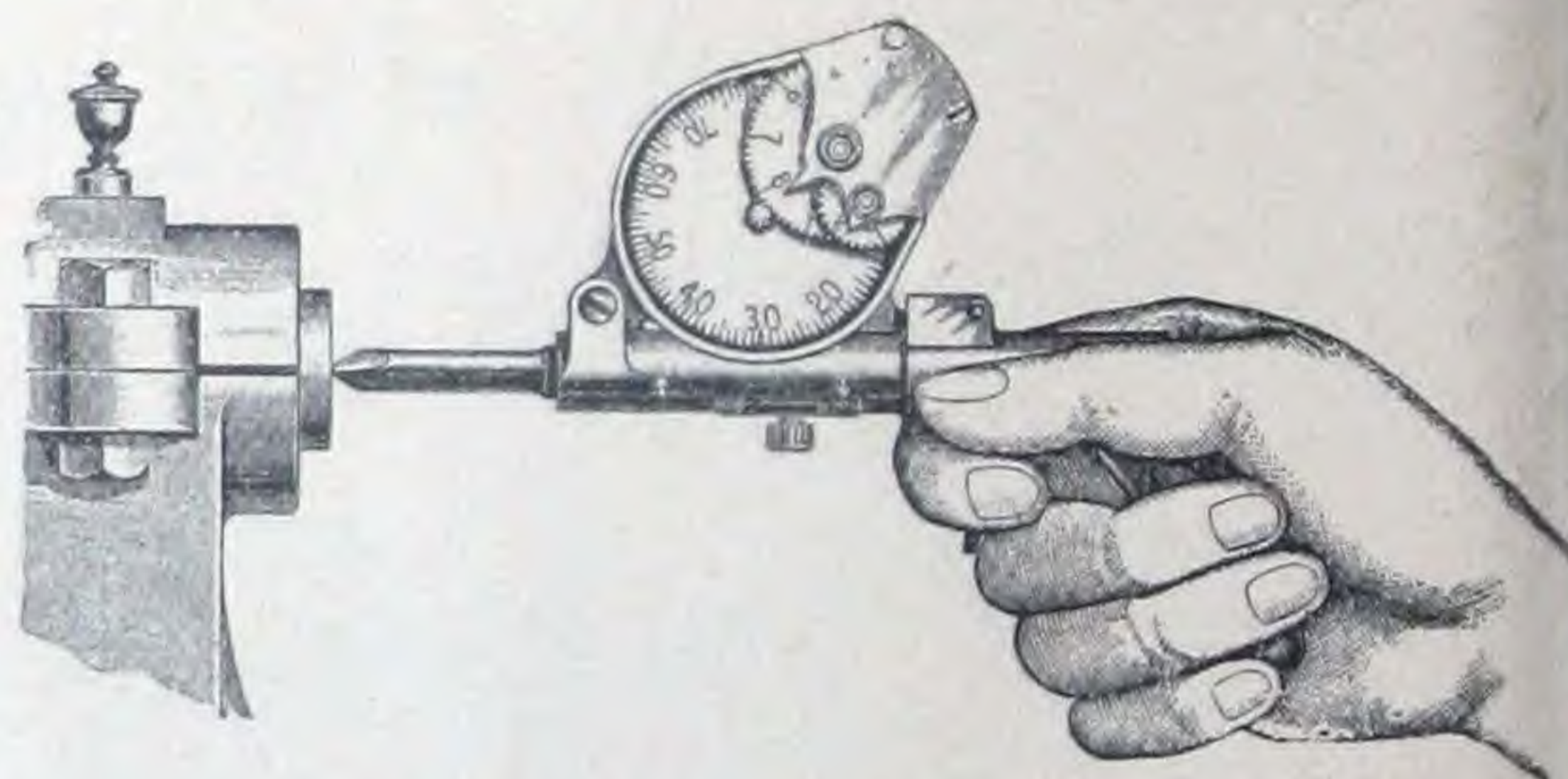


Fig. 2.

This device is shown in Fig. 1, where a portion of the bearing in which the spindle revolves is cut away so as to show the worm gear connections, and also to illustrate the ball bearing at the inner end of the spindle designed to sustain the end thrust when the device is in use. H is the handle, S the spindle, which has its outer end angularly pointed and its inner end provided with a ball bearing, B. F is the frame in which the dial-wheels  $D^1$ ,  $D^2$ ,  $D^3$ , are mounted and this frame is pivoted to the stock at P so that it can be moved downward on such pivoted connection against the force of a spring, to cause the teeth of the dial-wheel to engage with one of the worm gears on the spindle S. The letter D designates the dial-wheel which meshes into the worm gear, and is graduated to indicate units and tens of revolutions. This dial-wheel has a pinion which meshes with a dial-wheel  $D^2$  indicating hundreds, which in turn actuates another dial-wheel  $D^3$  indicating thousands of revolutions. This "thousands" dial is found very useful in connection with such high speed machinery as dynamos, motors, etc.

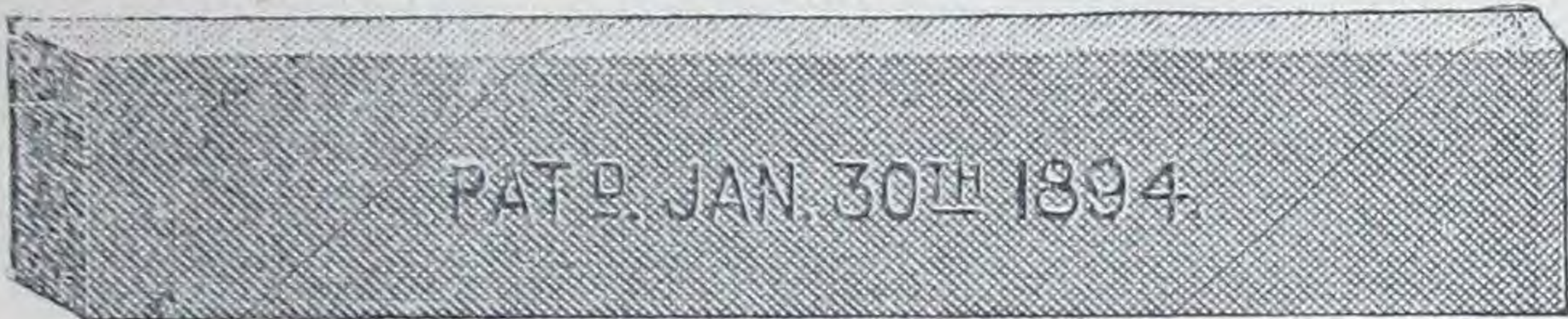
The dials can be easily and quickly reset to their normal positions at zero by turning the thumb-nut (which will be found at the back of the dial frame F) until the star on each dial-wheel is opposite its respective pointer. The letter X designates the shifter slide, which carries with it the two worms, one right-hand and the other left-hand, which, though mounted to rotate with the spindle S, have a sliding movement thereon controlled by the shifter X. This shifter may be pulled to the right or left according to the direction in which the shaft is running, as indicated by the letters R L on the slide, thereby revolving the dial-wheels always in the same direction, thus avoiding confusion in reading the result by having only one set of figures.

The letter T indicates the trigger form lever, by pulling which the dial-wheels are brought into operation, and which, in combination with the pistol-grip handle H, gives the instrument its accuracy. Shown in Fig. 2.

Trade Word.	List No.	Price.
Reenlist	3249	\$12 00



WIRE GAUZE DYNAMO BRUSH.



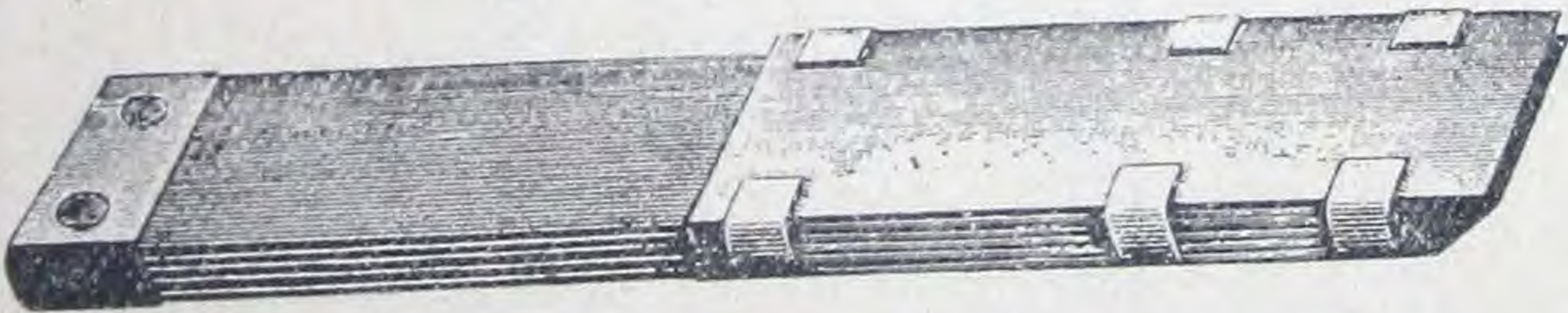
Trade Word.	List No.	Width, Inches.	Thickness, Inches.	Length, Inches.	Price.	Trade Word.	List No.	Width, Inches.	Thickness, Inches.	Length, Inches.	Price.
Reenlisted	3858 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{16}$	6	\$0 75	Referred	3868	$1\frac{3}{4}$	$\frac{1}{4}$	7	\$2 35
Reenlistment	3859	$\frac{3}{4}$	$\frac{1}{4}$	7	1 25	Refind	3869	$1\frac{3}{4}$	$\frac{3}{16}$	8	2 40
Reexport	3860	$\frac{1}{2}$	$\frac{1}{4}$	7	1 35	Refinery	3870	$1\frac{1}{2}$	$\frac{3}{8}$	8	2 75
Refashion	3861	1	$\frac{1}{4}$	7	1 50	Refinement	3871	$1\frac{1}{2}$	$\frac{5}{8}$	12	5 50
Refect	3862	$1\frac{1}{8}$	$\frac{1}{4}$	7	1 60	Refining	3872	2	$\frac{1}{4}$	8	2 75
Refectory	3863	$1\frac{1}{4}$	$\frac{1}{4}$	7	1 75	Refit	3873	2	$\frac{3}{8}$	8	3 00
Referable	3864	$1\frac{1}{4}$	$\frac{3}{16}$	7	1 75	Reflect	3874	$2\frac{1}{8}$	$\frac{3}{8}$	8	3 30
Referee	3865	$1\frac{3}{8}$	$\frac{1}{4}$	7	1 90	Reflected	3875	$2\frac{1}{8}$	$\frac{3}{16}$	8	3 20
Reference	3866	$1\frac{1}{2}$	$\frac{1}{4}$	7	2 00	Reflectent	3876	$2\frac{1}{4}$	$\frac{1}{4}$	8	3 40
Referment	3867	$1\frac{5}{8}$	$\frac{1}{4}$	7	2 25	Reflex	3877	$2\frac{1}{2}$	$\frac{1}{4}$	8	3 60

THOMSON-HOUSTON DYNAMO BRUSHES.  
FOR ARC MACHINES.



Trade Word.	List No.		Price.
Refloat	722	Copper ..... per set of four	\$1 00

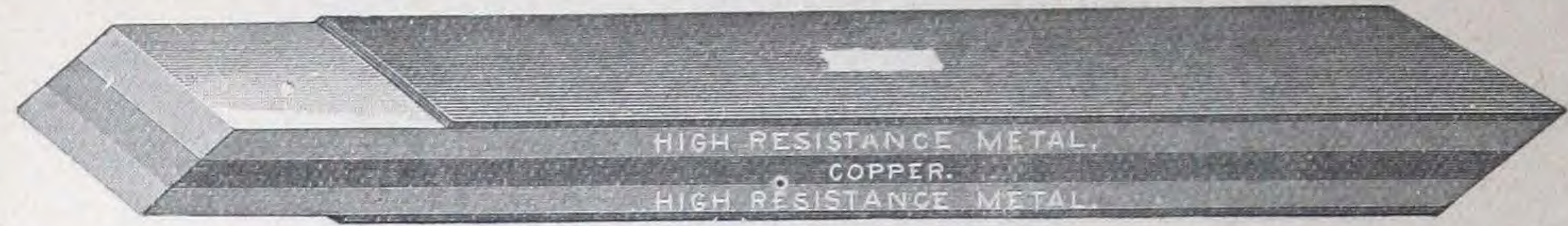
FOR INCANDESCENT MACHINES.



Trade Word.	List No.		Price.
Reflow	723	Copper, No. 1 ..... each	\$1 00
Reflux	724	“ “ 2 ..... “	1 50
Reformment	725	“ “ 3 ..... “	2 00



THE WIRT DYNAMO BRUSH.



WIRT BRUSHES.—Regular Stock Sizes.

Trade Word.	List No.	Style.	Thickness, Inches.	Width, Inches.	Length, Inches.	Capacity, Amperes.	List Price.
Reform	738	A	$\frac{9}{32}$	$\frac{1}{2}$	8	35	\$0 80
Reformed	739	B	$\frac{9}{32}$	1	8	65	1 10
Reformer	740	C	$\frac{3}{8}$	$1\frac{7}{8}$	8	160	2 00
Reforming	741	D	$\frac{3}{8}$	$1\frac{3}{8}$	$9\frac{1}{2}$	120	2 00
Reformist	742	E	$1\frac{1}{16}$	$1\frac{7}{8}$	12	250	5 00
Refossion	743	F	$\frac{1}{4}$	$1\frac{1}{4}$	8	75	1 40
Refound	744	G	$\frac{7}{16}$	$1\frac{7}{8}$	8	175	2 50
Refounding	745	H	$\frac{3}{4}$	$1\frac{3}{4}$	$9\frac{1}{2}$	250	4 50
Refract	746	I	$\frac{5}{16}$	$1\frac{1}{4}$	8	90	1 40
Refraction	747	J	$\frac{1}{2}$	$1\frac{3}{8}$	$9\frac{1}{2}$	150	2 50
Refractive	748	K	$\frac{1}{2}$	$1\frac{7}{8}$	8	200	2 75

The following is a list of the principal sizes of copper brushes used on Edison dynamos with reference to the corresponding sizes which we furnish. It should be noted that the regular Edison brushes are used with a brass "trough," which is removed when the Wirt brush is placed in the brush holder. The removal of this trough allows a certain increase of dimensions, which makes the Wirt brushes for Edison machines slightly larger than the brushes made by the Edison company:

Edison No.	Thickness, Inches.	Width, Inches.	Length, Inches.	Use Wirt Brush.
1	$\frac{7}{32}$	$\frac{27}{64}$	7	A
2	$\frac{7}{32}$	$\frac{15}{16}$	7	B
8	$\frac{11}{32}$	$1\frac{13}{16}$	8	C
20 old	$\frac{17}{32}$	$1\frac{5}{16}$	9	J
20 new	$\frac{5}{16}$	$1\frac{5}{16}$	9	D
32	$\frac{5}{8}$	$1\frac{13}{16}$	12	E

Following is a list of the principal sizes of copper brushes used on T.-H. dynamos and the proper size of Wirt brush to replace each:

Thickness, Inches.	Width, Inches.	Length, Inches.	Use Wirt Brush.
$\frac{1}{4}$	$1\frac{1}{8}$	$6\frac{1}{8}$	F
$\frac{5}{16}$	$1\frac{5}{16}$	$6\frac{3}{16}$	I
$\frac{11}{32}$	$1\frac{13}{16}$	$6\frac{13}{16}$	C
$\frac{15}{32}$	$1\frac{13}{16}$	7	K
$\frac{1}{2}$	$1\frac{13}{16}$	7	K
$\frac{13}{16}$	$1\frac{23}{32}$	$9\frac{1}{4}$	H

SPECIAL BRUSHES TO ORDER.

The following information where special brushes are wanted should be sent with the first order: Make of dynamo, number of brushes required, current and electro motive force of dynamo; kind of brush in use, length width and thickness of same, full size of opening in brush holder.



SOLDER.

Trade Word.	List No.			Price.
Refrain	1079	Bar solder.....	per pound	\$0 25
Refraining	1080	Trinangular solder.....	" "	25
Refrained	1081	Wire solder.....	" "	25

SOLDERING SALTS.

Trade Word.	List No.			Price.
Refresh	1082	In ½ lb. bottles.....	per pound	\$0 80
Refreshed	1083	" 1 " ".....	" "	95
Refreshing	1084	" 5 " ".....	" "	80
Refret	1085	" 10 " ".....	" "	80

CHATTERTON'S INSULATING COMPOUND.

Trade Word.	List No.		Price.
Refugee	1086	.....per pound	\$3 50

PURE MANILLA ROPE.

Trade Word.	List No.	Diameter, Inch.	Weight of 1000 Feet, Pounds.	Number Feet in one Pound.	Strength of New Manilla Rope, Pounds.	Price per Pound.
Refurbish ----	1119	¼	23	43	450	\$0 30
Refusal -----	1120	⅜	42	24	950	30
Refusing -----	1121	½	74	13½	1700	30



## COTTON WASTE.

Trade Word.	List No.		Price.
Refutable	515	White for dynamo work ----- per pound	\$0 14
Refutal	516	Colored for engine work ----- " "	11

## CROCUS CLOTH.

Trade Word.	List No.		Price.
Refute	517	In full sheets ----- per sheet	\$0 05
Regain	518	" " " ----- " quire	1 00

## EMERY CLOTH.

Trade Word.	List No.		Price.
Regal	519	In full sheets ----- per sheet	\$0 05
Regale	520	" " " ----- " quire	1 00

## INSULATING OIL PAPER.

USED IN INSULATING ARMATURES, FIELDS, ETC.

Trade Word.	List No.		Price.
Regalia	521	Size of sheet, 21x30 inches ----- each	\$0 20

## UNCUT SHEET MICA.

FOR ELECTRICAL PURPOSES.

Trade Word.	List No.	Will Cut in Width, Inches.	Will Cut in Length, Inches.	Price per Pound.	List No.	Will Cut in Width, Inches.	Will Cut in Length, Inches.	Price per Pound.
Regaling	522	5 to 10	7 to 16	\$5 40	525	2 to 4	4 to 6	\$1 30
Regard	523	3 " 6	6 " 10	3 60	526	1 " 3	2½ " 5	50
Regarding	524	2 " 5	4 " 8	2 00	527	4 " 10	6 " 12	3 70

## ARMATURE TWINE.

Trade Word.	List No.		Price.
Regardful	3221½	In half pound balls ----- per ball	\$1 25



## TROLLEY ROPE.

Trade Word.	List No.		Price.
Regatta	3933	$\frac{1}{4}$ inch diameter ----- per 100 feet	\$1 50
Regency	3934	$\frac{3}{8}$ " " ----- " " "	2 75

## BELL CORD.

Trade Word.	List No.		Price.
Regent	3935	$\frac{1}{4}$ inch round leather cord ----- per 100 feet	\$10 00
Regest	3936	Flat leather strap ----- " " "	8 00
Regible	3937	Braided drab cord ----- " " "	2 00

## BELL CORD COUPLINGS.

Trade Word.	List No.		Price.
Regicide	3938	Bronze ----- per pair	\$0 30
Regiment	3939	Polished brass ----- " " "	28

## FIBRE SHEET.

Trade Word.	List No.	Thickness, Inches.	Approx. Wt. of Full Sheets, Lbs.	PRICE PER POUND.		Trade Word.	List No.	Thickness, Inches.	Approx. Wt. of Full Sheets, Lbs.	PRICE PER POUND.	
				Full Sheets.	Cut to Order.					Full Sheets.	Cut to Order.
Sassafras	3940	1	115	\$0 80	\$1 25	Satire	3948	$\frac{1}{4}$	30 $\frac{1}{2}$	\$0 62 $\frac{1}{2}$	\$0 88
Satan	3941	$\frac{7}{8}$	97	75	1 20	Satiric	3949	$\frac{3}{16}$	20	62 $\frac{1}{2}$	85
Satanic	3942	$\frac{3}{4}$	86	75	1 18	Stirical	3950	$\frac{5}{32}$	16	62 $\frac{1}{2}$	85
Satanical	3943	$\frac{5}{8}$	70	75	1 15	Satirist	3951	$\frac{1}{2}$	14	62 $\frac{1}{2}$	85
Satanism	3944	$\frac{1}{2}$	63	62 $\frac{1}{2}$	90	Saterize	3952	$\frac{3}{32}$	11 $\frac{1}{2}$	62 $\frac{1}{2}$	85
Sateless	3945	$\frac{7}{16}$	54	62 $\frac{1}{2}$	90	Satrapal	3953	$\frac{1}{16}$	7 $\frac{1}{2}$	75	1 00
Satellite	3946	$\frac{3}{8}$	43	62 $\frac{1}{2}$	90	Satrapy	3954	$\frac{1}{8}$	5	82	1 10
Satinet	3947	$\frac{5}{16}$	35	62 $\frac{1}{2}$	90	Saturate	3955	$\frac{1}{50}$	3	90	1 35



## HILL'S TELESCOPING IRON TOWER WAGON.



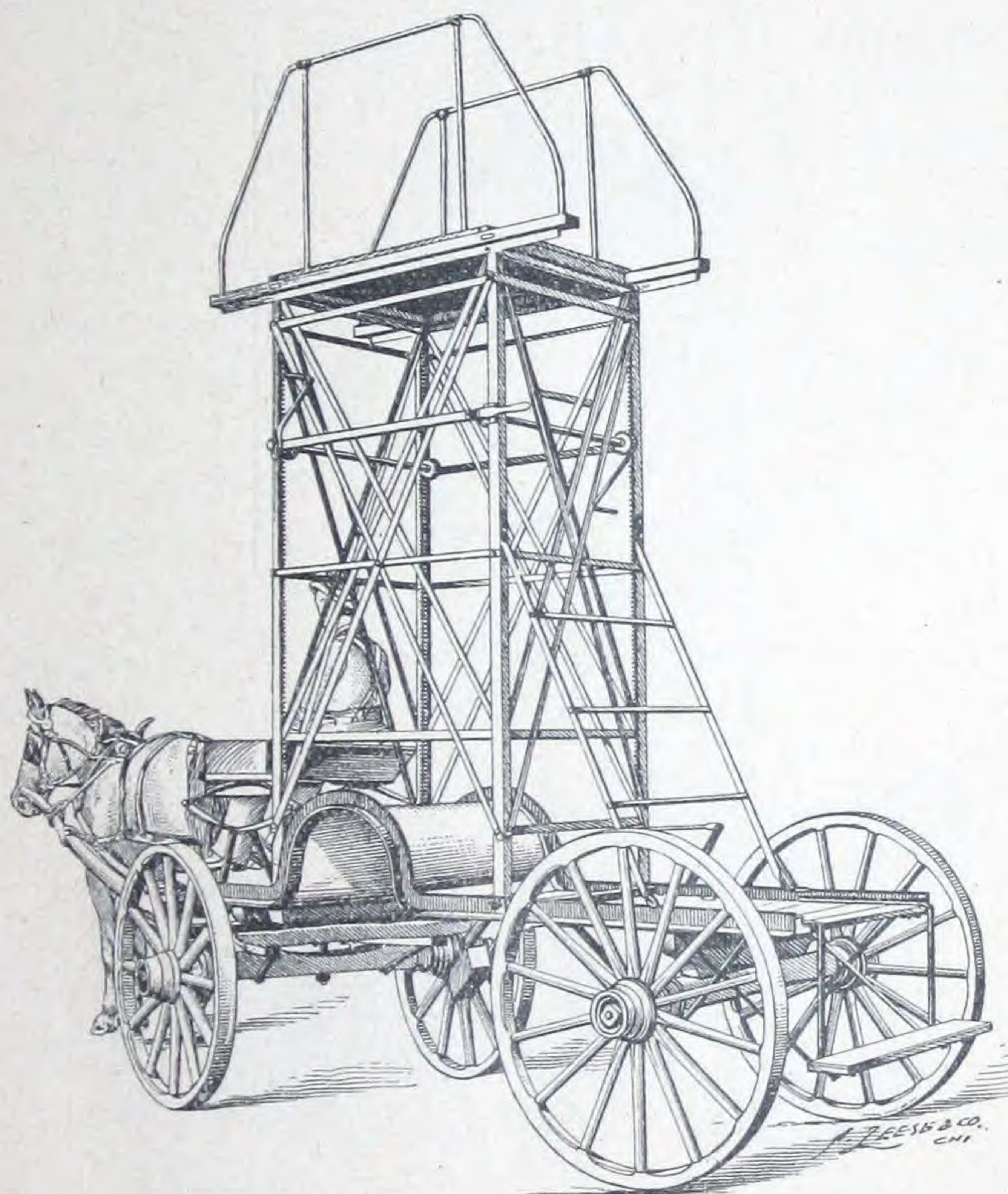
Patent Applied For.

STRONGEST, CHEAPEST AND BEST WAGON FOR OVER-  
HEAD WORK FOR ALL ELECTRIC STREET  
RAILWAY SYSTEMS.



We beg to call your attention to our improved tower wagon which we believe to possess many novel points not brought out by others, and submit the following description:

As you will observe, the tower is of the "telescoping" principle, and is built entirely of iron, except the platform above, which is of wood thoroughly insulated with rubber strips where the wood joins the iron, and by hard rubber bushings, where the bolts pass through, making it practically impossible to get a "ground," even if a ground connection were made from lower part of tower, and we have worked upon it in wet weather without the slightest danger.



Lowered.

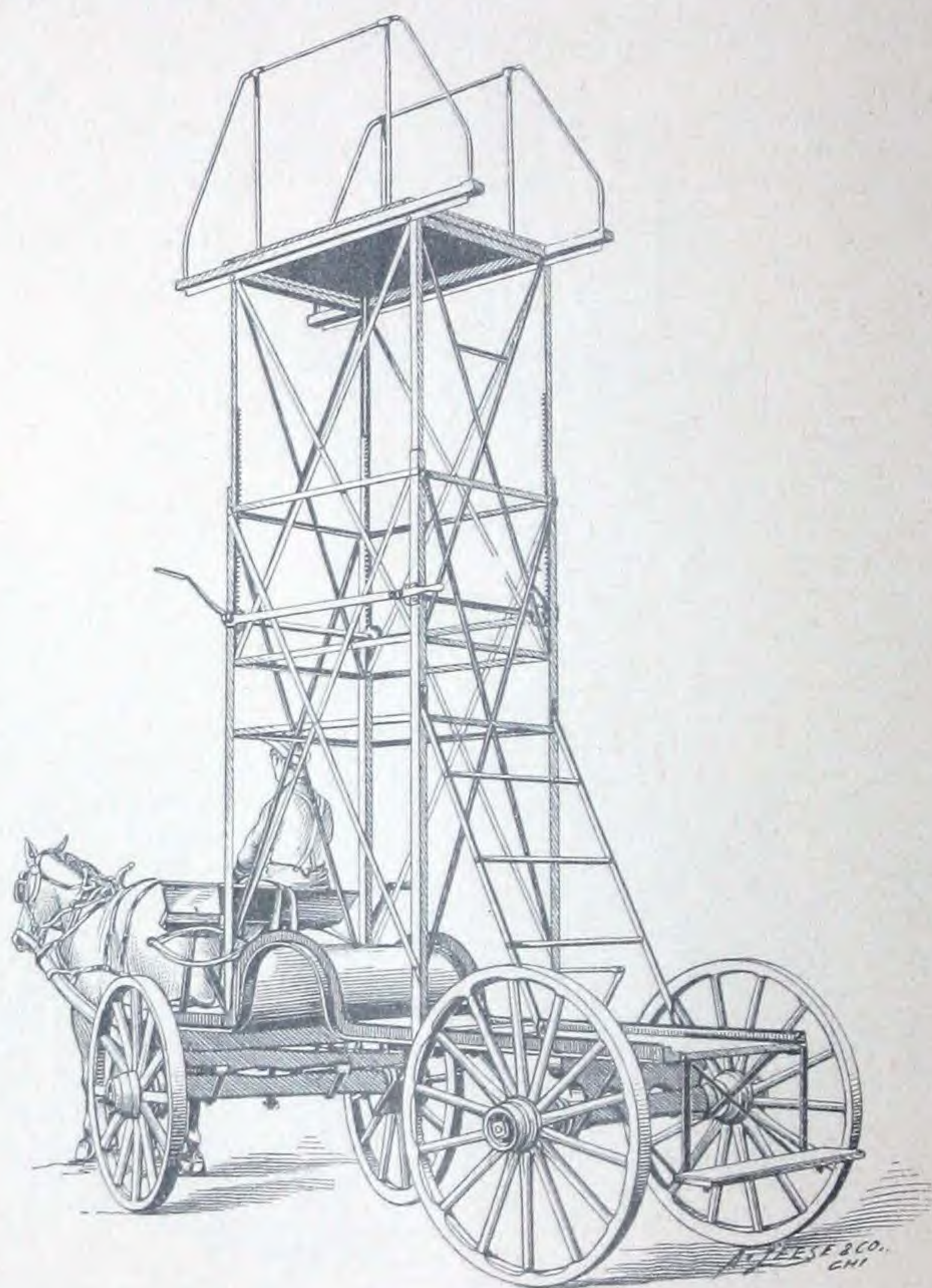
It is raised or lowered at will by four pinions working in racks at each corner, pinions being keyed to a shaft running across lower section and a crank being attached to each shaft at diagonally opposite corners, making it very easy for two men to work them, and allowing them also to slide the side bars over the square part of the shaft which holds the upper section rigidly in position it may be in, either at its full length, or low as desired.

The extreme height of tower when raised is  $15\frac{1}{2}$  feet from the ground, and when lowered 11 feet, though it can be made any height desired, and of two or more sections, but as the average height of trolley



wire is 20 feet, the above dimensions are suitable for all ordinary cases, and a great many times a man can work on the line without raising the upper section at all.

The wagon running gear is the well-known "O'Brien" with extra wide tires on wheels and top frame of T iron with arched turn-under which allows the wagon to be turned around in the smallest possible space without danger of upsetting, a feature which you will readily appreciate, as this danger has always been a drawback to the ordinary



Raised.

tower wagon, and besides the above advantages when working on "live" wires it is always safer to turn horses at right angles to trolley wires, thus avoiding the danger resulting from breaking of wire.

The platform of tower is 3 feet wide by 4 feet long fitted with gas pipe hand rails which let down on each side of tower by suitable hinges, thus admitting wagon and tower to be stored in an ordinary shed where it can be ready for use at a moment's notice.

The attachments for stringing wire shown in cut, are very complete in every way, consisting of reel for carrying wire fitted with band brake



for regulating speed of reel with two cranks on shaft to wind wire from ordinary reel, or to tighten wire when stringing wire, though this can be done by raising upper section and setting brake on reel and wagon. The grooved pulleys used on front and platform of tower guide the wire without "kinking" it, a feature which all linemen will appreciate, and the smaller pulley has lateral motion on shaft which allows the wire to travel the full length of the reel without crossing the coils. The bracket bearings which carry reel are bolted directly to the T iron frame of wagon, and all bearings are babbitted and are adjustable, and the attachments can be removed in a short time.

Wagons can be built to any gauge, and for one or two horses and with ample tool box under driver's seat, and fitted with pole or shafts, or both, and with wide or narrow tires, though it is advisable to make tires wide as this gives a good bearing on the ground.

We will be glad to submit prices and trade discounts on above wagon, or on tower alone, as we are prepared to make them of any size, or to fit in any wagon, in large or small lots, or singly, as desired.

Designed by a practical street railway superintendent.

Built by experienced structural iron workers.

Those in use are giving excellent satisfaction.

Prices given on application.

Correspondence solicited.

FULL  
WEIGHT

IT  
STICKS

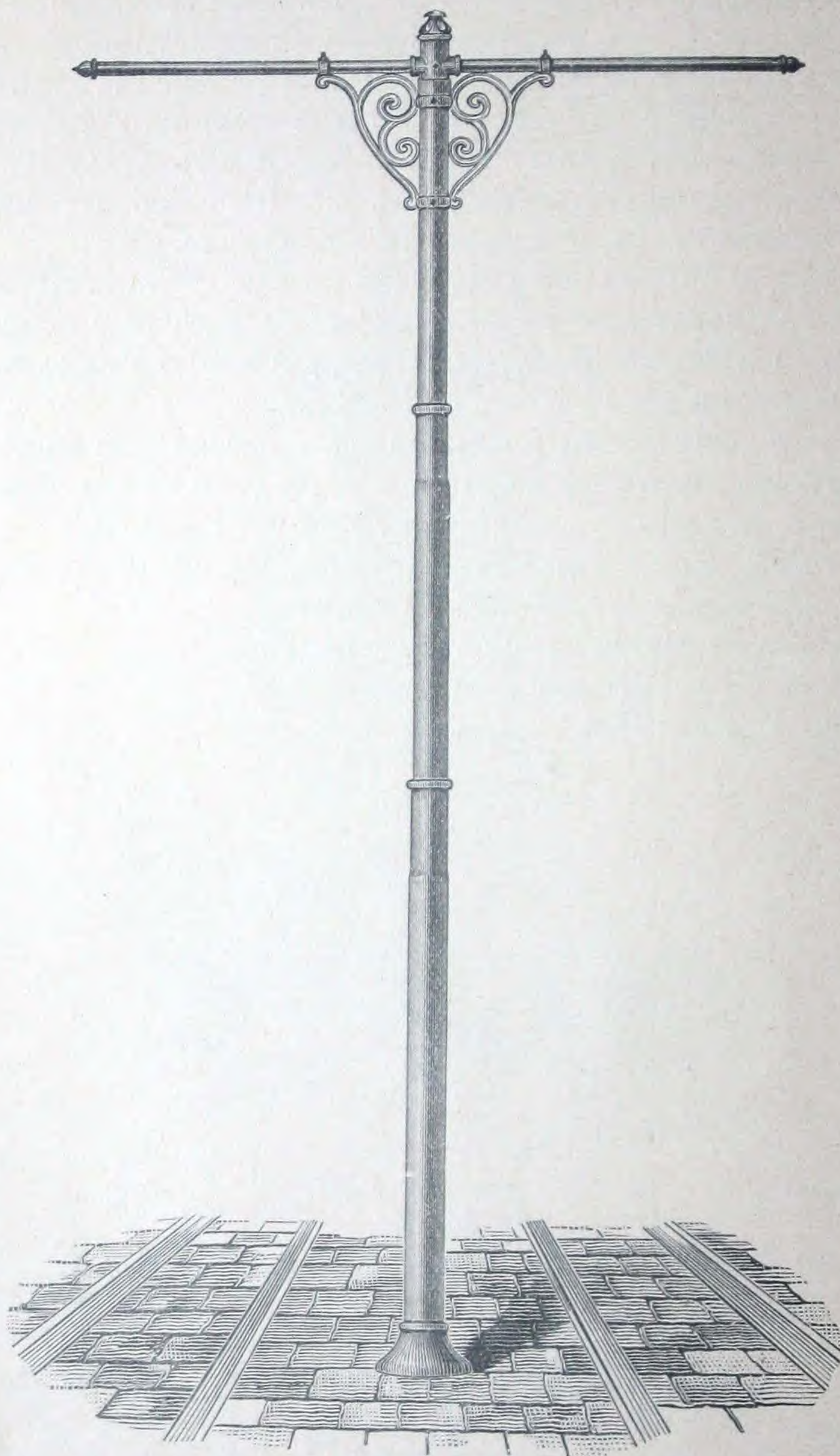
"M  
USE A TAPE  
C"

DOES NOT  
CORRODE

WON'T  
DRY UP



## WROUGHT IRON POLES.



Trade  
Word.  
Region

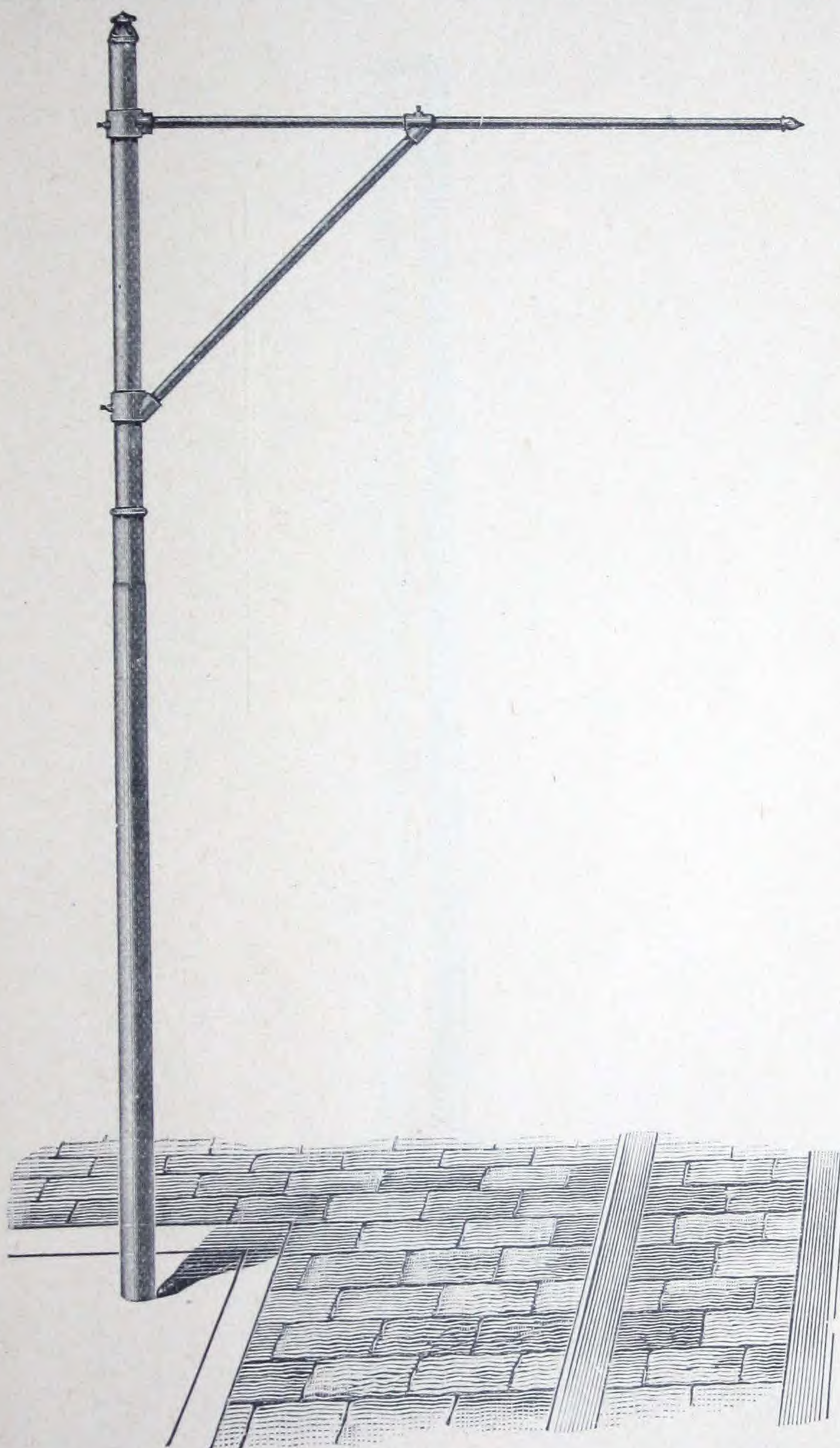
List  
No.  
3878

Price.

on application



# WROUGHT IRON POLES—Continued.



Trade  
Word.  
Register

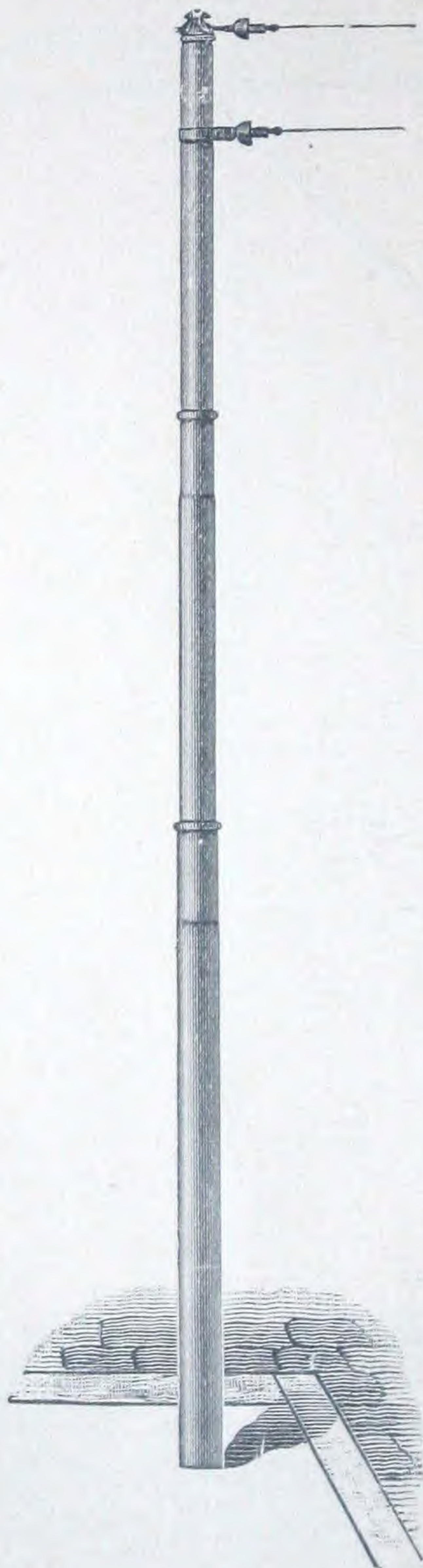
List  
No.  
3879

Price.

on application



## WROUGHT IRON POLES—Continued.



Trade  
Word.  
Registry

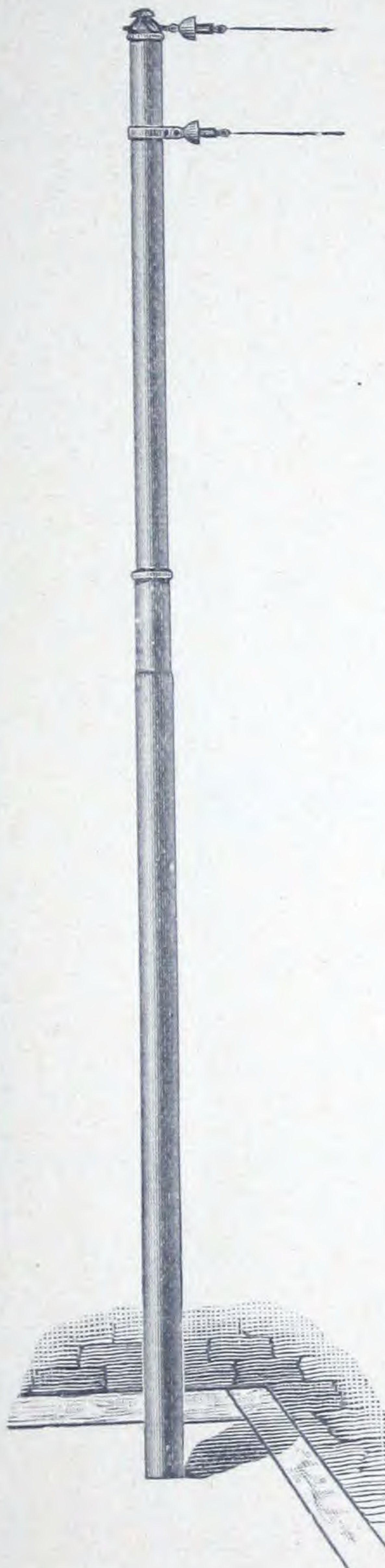
List  
No.  
3880

Price.

.....on application



# WROUGHT IRON POLES—Continued.



Trade  
Word.  
Reglet

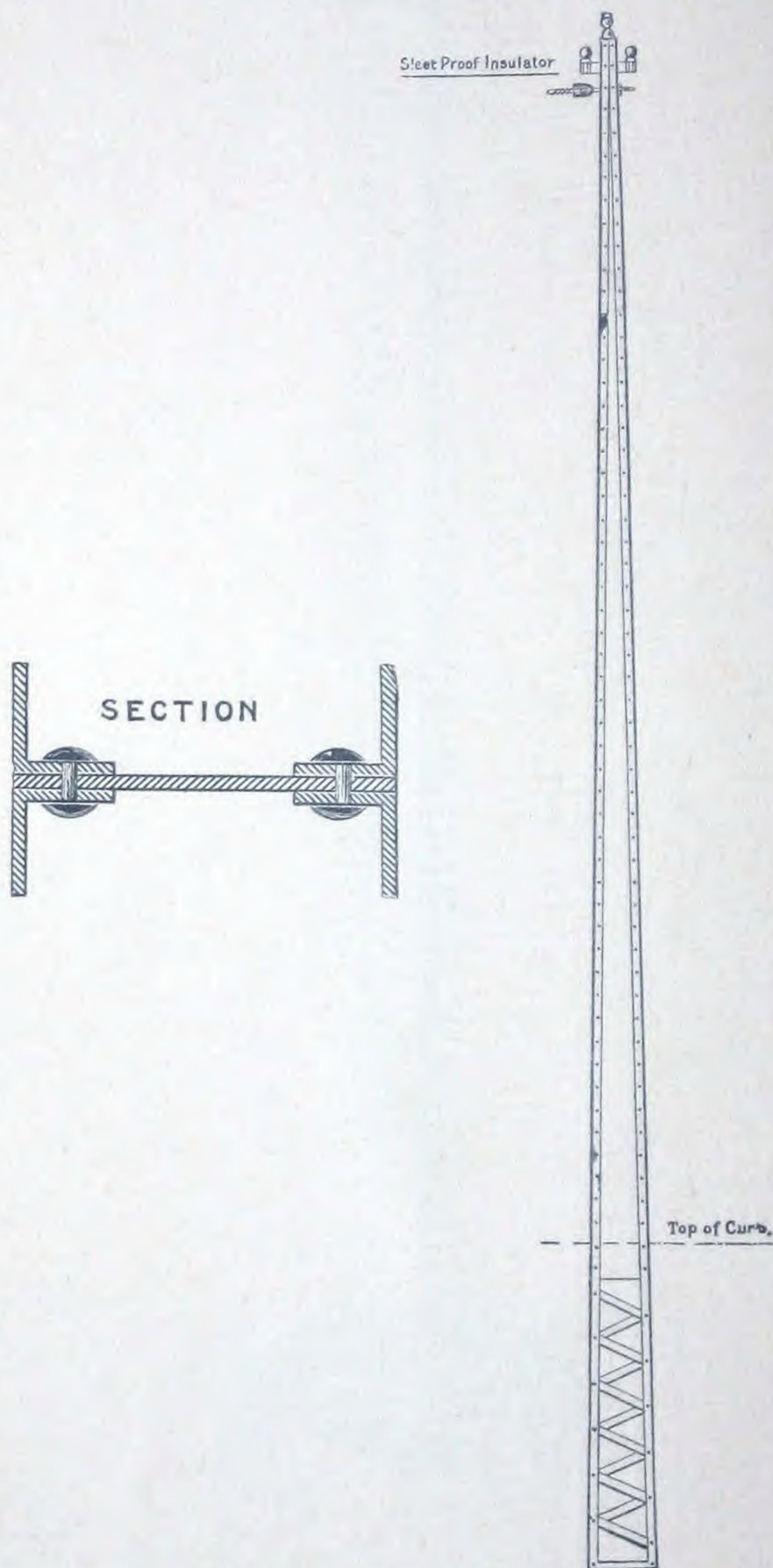
List  
No.  
3881

Price.

on application



## WROUGHT IRON POLES—Continued.



Trade  
Word.  
Regnant

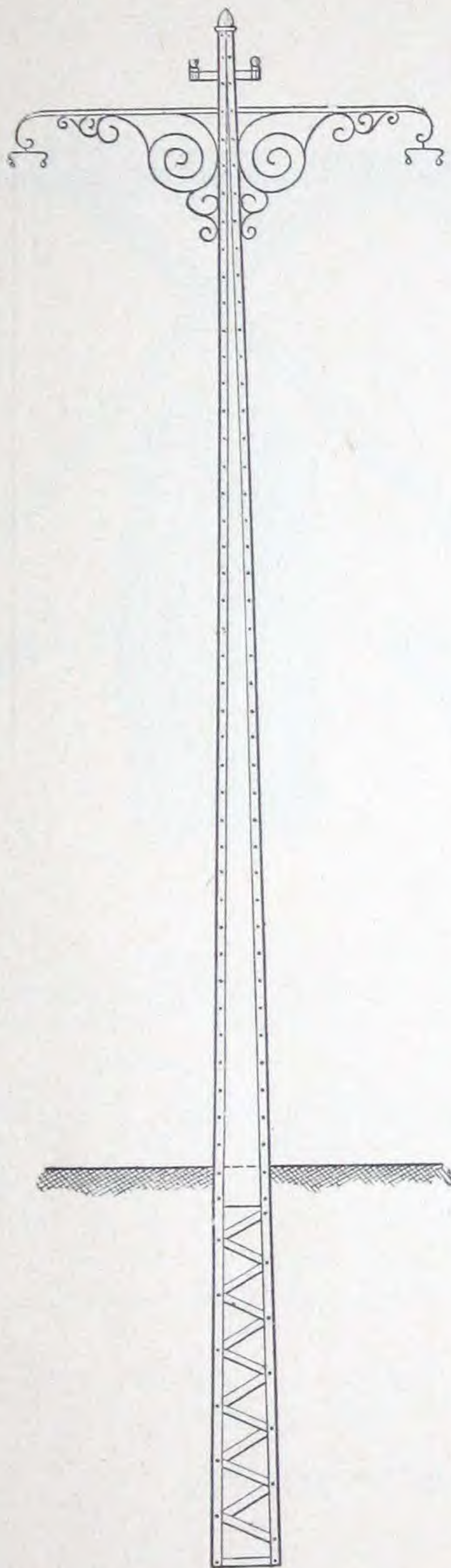
List  
No.  
3882

Price.

on application



## WROUGHT IRON POLES—Continued.



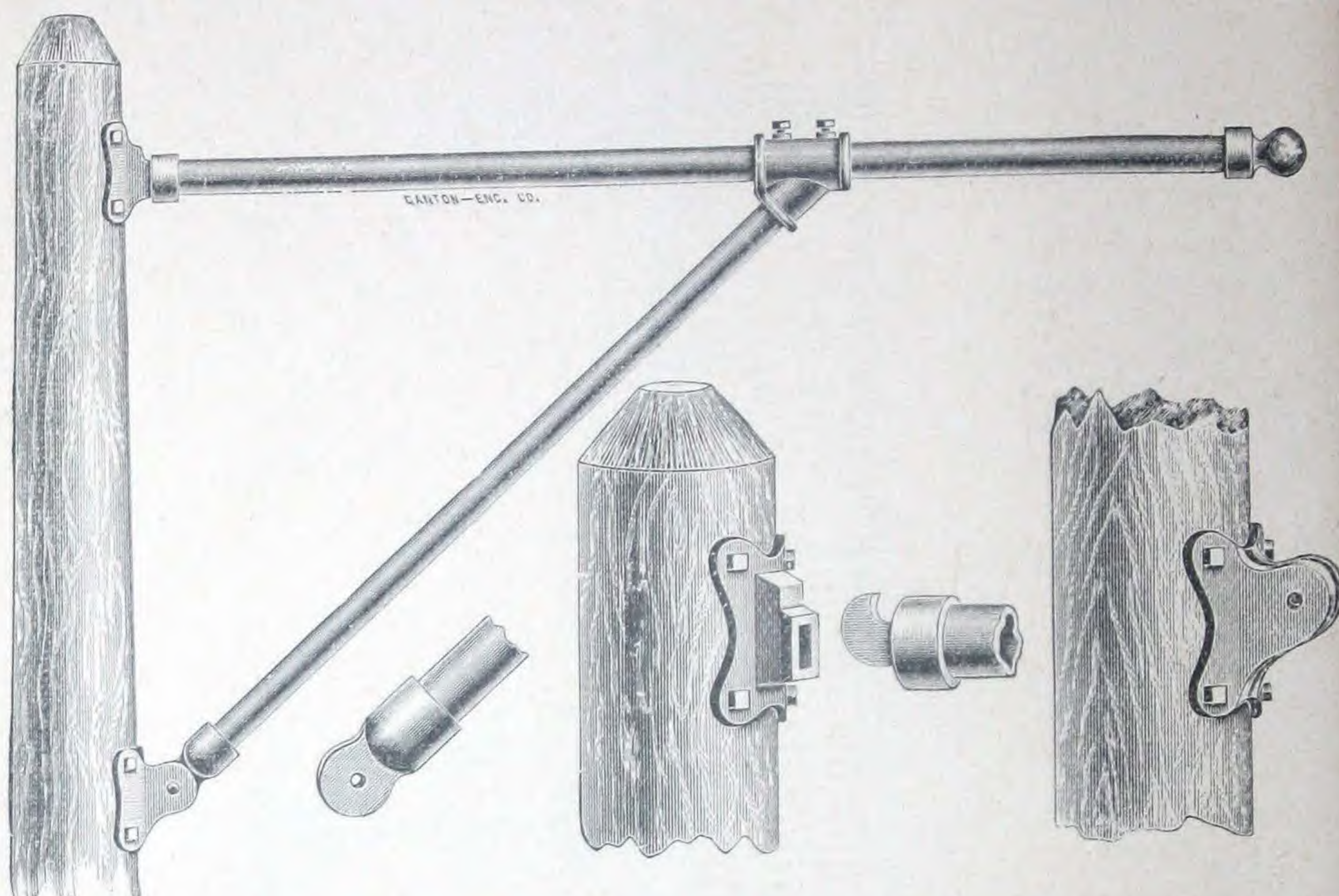
Trade  
Word.  
Regraft

List  
No.  
3883

Price.  
on application



## ADJUSTABLE POLE BRACKET.



This bracket combines lightness with great strength. The parts are interchangeable, and it is quickly and easily hung in position.

Trade Word.	List No.		Price.
Regrant	3056	6-foot arm, 1½ inch pipe	each \$5 00
Regrate	3057	7 " " 1½ " "	" 5 50

Special sizes made to order.

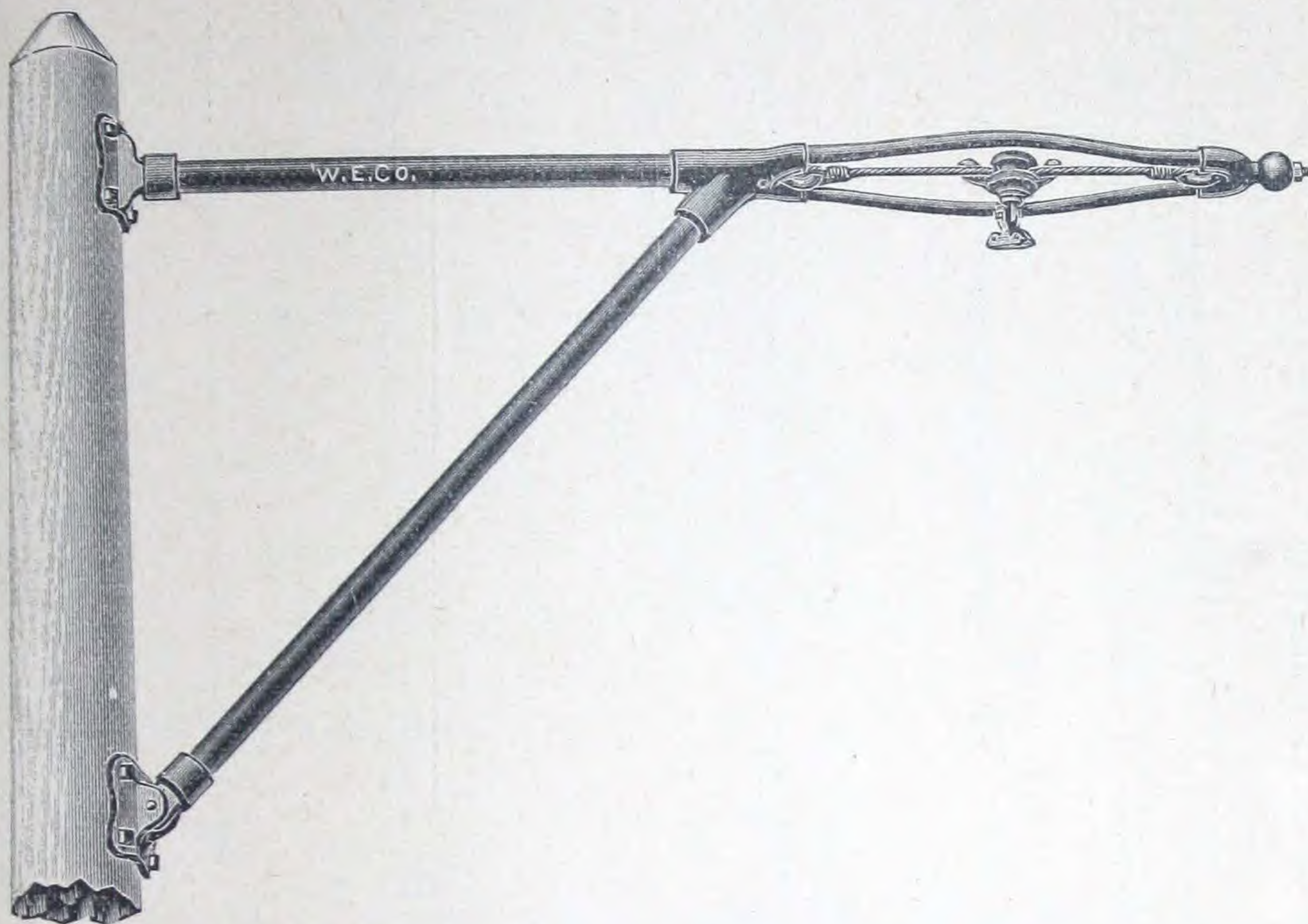
TO MAKE WATERPROOF JOINTS

USE "MAC" TAPE.

IT'S THE BEST.



## COMBINATION POLE BRACKET.



Our combination pole bracket differs somewhat in construction from the ordinary pipe brackets. Its interchangeable features are similar to our No. 3056, shown on page 116, differing only in the fact that it is made with two curved arms, extending from the brace casting which supports the span wire.

The span wire is easily adjusted by means of an eye bolt at the extreme end of the bracket. This bracket affords a flexible support for the insulator, thereby doing away with the hammering effect received from the trolley wheel as in rigid construction. By referring to the above cut it will be seen that a straight line hanger is to be used for supporting the trolley wire in place of the ordinary pipe bracket hanger.

We claim for this bracket an easy and quick adjustment, light and strong construction, and with our improvement the liability of breakage is reduced to a minimum.

Trade Word.	List No.		Price.
Regreet	3054	6-foot arm, $1\frac{1}{4}$ inch pipe	each \$7 00
Regress	3055	7 " " $1\frac{1}{2}$ " "	" 7 50

Special sizes made to order.



# OCTOGONAL POLES.



Trade Word.	List No.	9 inch	Price.
Regret	3282	9 inch	on application
Regular	3283	10 "	"
Regulate	3284	11 "	"



POLES.

List No. 822.

Trade Word.	SIZE.		Average Weight, Pounds Each.	Approximate No. of Poles to a Car.	Trade Word.	SIZE.		Average Weight, Pounds Each.	Approximate No. of Poles to a Car.
	Ft.	In.				Ft.	In.		
Reguline -----	25	4	160	170	Rejoicing -----	35	7	650	90
Regulize -----	25	5	200	150	Rejoined -----	35	8	700	85
Regulus -----	25	6	250	120	Rejolt -----	35	9	850	70
Reheard -----	25	7	325	100	Rejourn -----	40	6	800	80
Rehearsal -----	25	8	475	75	Rejudge -----	40	7	900	75
Rehearse -----	25	9	550	60	Rejudging -----	40	8	950	70
Reigle -----	30	5	300	110	Rekindle -----	45	6	1000	65
Reign -----	30	6	350	90	Reland -----	45	7	1200	55
Reigning -----	30	7	420	75	Relapse -----	50	6	1400	52
Reject -----	30	8	600	55	Relapsing -----	50	7	1500	40
Rejectable -----	30	9	700	45	Relate -----	55	7	1600	37
Rejoice -----	35	6	550	100	Related -----	60	7	1700	35

Poles 40 feet long and over require two cars.

STANDARD CROSS ARMS.



Painted two coats red. Regular size 3¾ x 4¼ inches. Bored for 1½ inch pins and two ½ inch bolts.

Trade Word.	List No.	Length, Feet.	No. Pins.	SPACINGS.			Price Each.
				End, Inches.	Center, Inches.	Sides, Inches.	
Relation -----	823	3	2	4	28	-----	\$0 18
Relative -----	824	4	4	4	16	12	24
Relator -----	825	5	4	4	18	17	30
Relax -----	826	6	4	4	22	21	36
Relaxable -----	827	6	6	4	16	12	41
Relaxant -----	828	8	6	4	18	17½	48
Relaxed -----	829	8	8	4	16	12	53
Relaxing -----	830	10	8	4	17½	15¾	Special
Relay -----	831	10	10	4	16	12	"



LONG LEAF YELLOW PINE CROSS ARMS.



GOVERNMENT TESTS.

	White or Northern Pine.	Long Leaf Yellow Pine.
Tensile strength	10,700 lbs. to sq. in.	21,300 lbs. to sq. in.
Cross breaking modulus	6,620 " " " "	13,300 " " " "
Breaking load	3,820 " " " "	5,060 " " " "

The results of further investigation show the long leaf pine to be fully 40 per cent stronger and much more durable.

Unless otherwise ordered we use the best quality of creosote paint.

The latest results show that this cross arm has 35 per cent longer life than any other on the market.

Are finished 3¼ and 4¼ inches and painted red, two coats, boared for 1½ inch pins and two ½ inch bolts. We can make any size to order, but only carry the following standard sizes in stock:

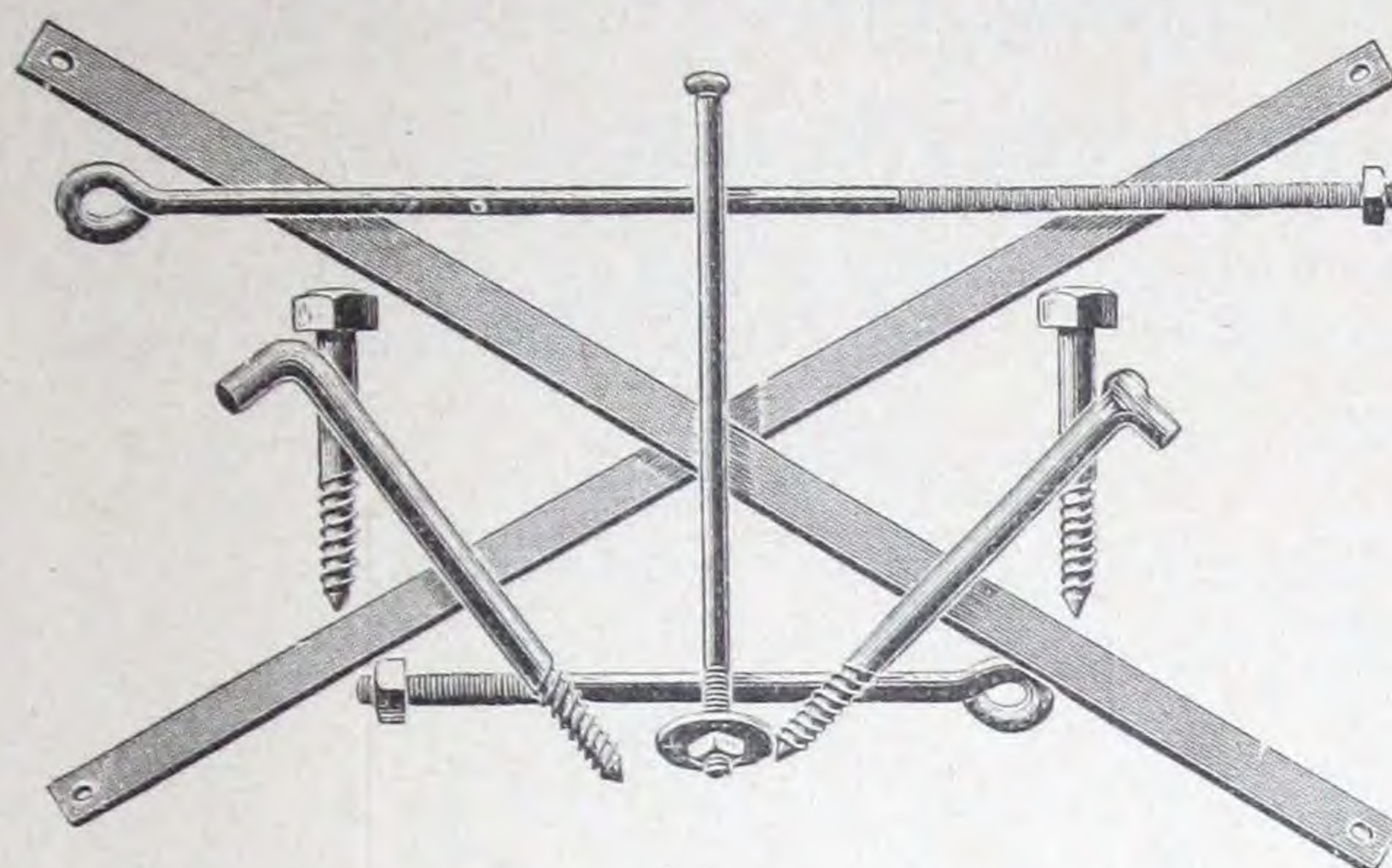
PRICES.

Trade Word.	List No.	No. Pins.	Length, Feet.	SPACING.			Price.
				End, Inches.	Centre, Inches.	Sides, Inches.	
Winter	3965	2	3	4	28		\$0 18
Winzle	3966	4	5	4	18	17	
Wiper	3967	6	8	4	18	17½	30
Wisdom	3968	8	10	4	17½	15¾	48
Witch	3969	4	4	4	16	12	60
Witticism	3970	6	6	4	16	12	24
Wizard	3971	8	8	4	16	12	41
Wizen	3972	10	10	4	16	12	53
							60

SEE PAGE 14 FOR "MAC" TAPE.



## LAG SCREWS.



Trade Word.	List No.		Price.
Release	832	$\frac{1}{2}$ x6 in. with washers (for cross arms) ----- each	\$0 05
Relegate	833	$\frac{1}{2}$ x7 " " " " ----- "	05 $\frac{1}{2}$
Relent	834	$\frac{1}{2}$ x8 " " " " ----- "	06
Relented	835	$\frac{5}{16}$ x2 " " " (for cross arm brace) ---- "	03
Relenting	836	$\frac{5}{16}$ x3 " " " " ----- "	03 $\frac{1}{2}$

## POLE STEPS.

Trade Word.	List No.		Price.
Relevance	837	Plain, $\frac{9}{16}$ x9 $\frac{1}{2}$ ----- per 100	\$5 50
Relevant	838	Galvanized, $\frac{9}{16}$ x9 $\frac{1}{2}$ ----- " "	8 00

## CROSS ARM BRACES.

Trade Word.	List No.		Price.
Reliance	839	Japanned, length 20 inches ----- each	\$0 10
Relic	840	Galvanized, " 20 " ----- "	12
Relied	841	Japanned, " 24 " ----- "	11
Relieved	842	Galvanized, " 24 " ----- "	13

## WELDED EYE BOLTS.

FOR SUSPENSION AND GUY WIRES.

Trade Word.	List No.		Price.
Relight	843	$\frac{1}{2}$ x10 ----- each	\$0 09
Religion	844	$\frac{1}{2}$ x12 ----- "	10



# MACHINE BOLTS.

## WITH SQUARE HEADS AND NUTS.

Standard List of the Association of Bolt and Nut Manufacturers of the United States. Adopted December 17, 1889; to take effect January 1, 1890.

PRICE PER 100.

Length, Inches.	$\frac{1}{4}$ Inch.	5-16 Inch.	$\frac{3}{8}$ Inch.	7-16 Inch.	$\frac{1}{2}$ Inch.	9-16 & $\frac{5}{8}$ Inch.	$\frac{3}{4}$ Inch.	$\frac{7}{8}$ Inch.	1 Inch.
1 $\frac{1}{2}$	\$2 80	\$3 20	\$3 60	\$4 60	\$6 00	\$9 00	\$12 70	\$18 80	\$27 50
1 $\frac{3}{4}$	2 85	3 30	3 70	4 75	6 20	9 30	13 00	19 30	28 15
2	2 90	3 35	3 80	4 90	6 35	9 55	13 45	19 80	28 80
2 $\frac{1}{4}$	2 95	3 45	3 90	5 05	6 55	9 85	13 85	20 30	29 45
2 $\frac{1}{2}$	3 00	3 50	4 00	5 20	6 70	10 10	14 20	20 80	30 10
2 $\frac{3}{4}$	3 05	3 60	4 10	5 35	6 90	10 40	14 60	21 30	30 75
3	3 10	3 65	4 20	5 50	7 05	10 65	14 95	21 80	31 40
3 $\frac{1}{4}$	3 15	3 75	4 30	5 65	7 25	10 95	15 35	22 30	32 05
3 $\frac{1}{2}$	3 20	3 80	4 40	5 80	7 40	11 20	15 70	22 80	32 70
3 $\frac{3}{4}$	3 25	3 90	4 50	5 95	7 60	11 50	16 10	23 30	33 35
4	3 30	3 95	4 60	6 10	7 75	11 75	16 45	23 80	34 00
4 $\frac{1}{4}$	3 35	4 05	4 70	6 25	7 95	12 05	16 85	24 30	34 65
4 $\frac{1}{2}$	3 40	4 10	4 80	6 40	8 10	12 30	17 20	24 80	35 30
4 $\frac{3}{4}$	3 45	4 20	4 90	6 55	8 30	12 60	17 60	25 30	35 95
5	3 50	4 25	5 00	6 70	8 45	12 85	17 95	25 80	36 60
5 $\frac{1}{2}$	3 60	4 40	5 20	7 00	8 80	13 40	18 70	26 80	37 90
6	3 70	4 55	5 40	7 30	9 15	13 95	19 45	27 80	39 20
6 $\frac{1}{2}$	3 80	4 70	5 60	7 60	9 50	14 50	20 20	28 80	40 50
7	3 90	4 85	5 80	7 90	9 85	15 05	20 95	29 80	41 80
7 $\frac{1}{2}$	4 00	5 00	6 00	8 20	10 20	15 60	21 70	30 80	43 10
8	4 10	5 15	6 20	8 50	10 60	16 20	22 50	31 80	44 40
8 $\frac{1}{2}$	-----	5 30	6 40	8 80	10 95	16 75	23 75	32 80	45 70
9	-----	5 45	6 60	9 10	11 30	17 30	24 00	33 80	47 00
9 $\frac{1}{2}$	-----	5 60	6 80	9 40	11 65	17 95	24 75	34 80	48 30
10	-----	5 75	7 00	9 70	12 00	18 40	25 50	35 80	49 60
10 $\frac{1}{2}$	-----	5 90	7 20	10 00	12 35	18 95	26 25	36 80	50 90
11	-----	6 05	7 40	10 30	12 70	19 50	27 00	37 80	52 20
11 $\frac{1}{2}$	-----	6 20	7 60	10 60	13 05	20 15	27 75	38 80	53 50
12	-----	6 35	7 80	10 90	13 40	20 60	28 50	39 80	54 80
12 $\frac{1}{2}$	-----	-----	-----	-----	13 75	21 15	29 25	40 80	56 10
13	-----	-----	-----	-----	14 10	21 70	30 00	41 80	57 40
13 $\frac{1}{2}$	-----	-----	-----	-----	14 45	22 25	30 75	42 80	58 70
14	-----	-----	-----	-----	14 80	22 80	31 50	43 80	60 00
14 $\frac{1}{2}$	-----	-----	-----	-----	15 15	23 35	32 75	44 80	61 30
15	-----	-----	-----	-----	15 50	23 90	33 00	45 80	62 60
15 $\frac{1}{2}$	-----	-----	-----	-----	15 85	24 45	33 75	46 80	63 90
16	-----	-----	-----	-----	16 20	25 00	34 50	47 80	65 20
16 $\frac{1}{2}$	-----	-----	-----	-----	16 55	25 55	35 25	48 80	66 50
17	-----	-----	-----	-----	16 90	26 10	36 00	49 80	67 80
17 $\frac{1}{2}$	-----	-----	-----	-----	17 25	26 65	36 75	50 80	69 10
18	-----	-----	-----	-----	17 60	27 20	37 50	51 80	70 40
18 $\frac{1}{2}$	-----	-----	-----	-----	17 95	27 75	38 25	52 80	71 70
19	-----	-----	-----	-----	18 30	28 30	39 00	53 80	73 00
19 $\frac{1}{2}$	-----	-----	-----	-----	18 65	28 85	39 75	54 80	74 30
20	-----	-----	-----	-----	19 00	29 40	40 50	55 80	75 60



## COMMON CARRIAGE BOLTS.

WITH SHORT FULL SIZE SQUARE UNDER HEADS, FORGED  
NUTS AND FINISHED POINTS.

Manufacturers' standard list of common carriage bolts, adopted June 10, 1884.

PRICE PER 100.

Length, Inches.	Diameter 3-16 and $\frac{1}{4}$ Inch.	Diameter 5-16 Inch.	Diameter $\frac{3}{8}$ Inch.	Diameter 7-16 Inch.	Diameter $\frac{1}{2}$ Inch.	Diameter 9-16 and $\frac{5}{8}$ Inch.	Diameter $\frac{3}{4}$ Inch.
1 to $1\frac{1}{2}$	\$1 35	\$1 60	\$2 30	\$3 10	\$3 80	\$7 50	-----
$1\frac{3}{4}$	1 40	1 68	2 30	3 10	3 80	7 50	-----
2	1 45	1 75	2 30	3 10	3 80	7 50	-----
$2\frac{1}{4}$	1 50	1 83	2 40	3 23	3 96	7 50	-----
$2\frac{1}{2}$	1 55	1 90	2 50	3 35	4 12	7 50	-----
$2\frac{3}{4}$	1 60	1 98	2 60	3 48	4 28	7 50	-----
3	1 65	2 05	2 70	3 60	4 44	7 50	\$13 50
$3\frac{1}{4}$	1 70	2 13	2 80	3 73	4 60	7 75	13 85
$3\frac{1}{2}$	1 75	2 20	2 90	3 85	4 76	8 00	14 20
$3\frac{3}{4}$	1 80	2 28	3 00	3 98	4 92	8 25	14 55
4	1 85	2 35	3 10	4 10	5 08	8 50	14 90
$4\frac{1}{4}$	1 90	2 43	3 20	4 23	5 24	8 75	15 25
$4\frac{1}{2}$	1 95	2 50	3 30	4 35	5 40	9 00	15 60
$4\frac{3}{4}$	2 00	2 58	3 40	4 48	5 56	9 25	15 95
5	2 05	2 65	3 50	4 60	5 72	9 50	16 30
$5\frac{1}{4}$	2 10	2 73	3 60	4 73	5 88	9 75	16 65
$5\frac{1}{2}$	2 15	2 80	3 70	4 85	6 04	10 00	17 00
$5\frac{3}{4}$	2 20	2 88	3 80	4 98	6 20	10 25	17 35
6	2 25	2 95	3 90	5 10	6 36	10 50	17 70
$6\frac{1}{4}$	2 30	3 03	4 00	5 23	6 52	10 75	18 05
$6\frac{1}{2}$	2 35	3 10	4 10	5 35	6 68	11 00	18 40
7	2 45	3 25	4 30	5 60	7 00	11 50	19 10
$7\frac{1}{2}$	2 55	3 40	4 50	5 85	7 32	12 00	19 80
8	2 65	3 55	4 70	6 10	7 64	12 50	20 50
$8\frac{1}{2}$	2 75	3 70	4 90	6 35	7 96	13 00	21 20
9	2 85	3 85	5 10	6 60	8 28	13 50	21 90
$9\frac{1}{2}$	2 95	4 00	5 30	6 85	8 60	14 00	22 60
10	3 05	4 15	5 50	7 10	8 92	14 50	23 30
$10\frac{1}{2}$	3 15	4 30	5 70	7 35	9 24	15 00	24 00
11	3 25	4 45	5 90	7 60	9 56	15 50	24 70
$11\frac{1}{2}$	3 35	4 60	6 10	7 85	9 88	16 00	25 40
12	3 45	4 75	6 30	8 10	10 20	16 50	26 10
$12\frac{1}{2}$	3 55	4 90	6 50	8 35	10 52	17 00	26 80
13	3 65	5 05	6 70	8 60	10 84	17 50	27 50
$13\frac{1}{2}$	3 75	5 20	6 90	8 85	11 16	18 00	28 20
14	3 85	5 35	7 10	9 10	11 48	18 50	28 90
$14\frac{1}{2}$	3 95	5 50	7 30	9 35	11 80	19 00	29 60
15	4 05	5 65	7 50	9 60	12 12	19 50	30 30
$15\frac{1}{2}$	4 15	5 80	7 70	9 85	12 44	20 00	31 00
16	4 25	5 95	7 90	10 10	12 76	20 50	31 70
Advance per Inch.	\$0 20	\$0 30	\$0 40	\$0 50	\$0 64	\$1 00	\$1 40



COACH OR LAG SCREWS.

Manufacturer's Standard List. Revised and adopted December 17, 1889; to take effect Janaary 1, 1890.

PRICE PER 100.

Length, Inches.	5-16 Inch.	$\frac{3}{8}$ Inch.	7-16 Inch.	$\frac{1}{2}$ Inch.	9-16 & $\frac{5}{8}$ Inch.	$\frac{3}{4}$ Inch.	$\frac{7}{8}$ Inch.	1 Inch.
1 $\frac{1}{2}$	\$2 70	\$3 10	\$4 00	\$4 30				
1 $\frac{3}{4}$	2 80	3 20	4 15	4 50				
2	2 90	3 30	4 25	4 65	\$6 50			
2 $\frac{1}{4}$	3 00	3 40	4 40	4 85	6 80			
2 $\frac{1}{2}$	3 10	3 50	4 50	5 00	7 05	\$10 20		
2 $\frac{3}{4}$	3 20	3 60	4 65	5 20	7 35	10 60		
3	3 30	3 70	4 75	5 35	7 60	10 95	\$16 00	
3 $\frac{1}{4}$	3 40	3 80	4 90	5 55	7 90	11 30	16 50	
3 $\frac{1}{2}$	3 50	3 90	5 00	5 70	8 15	11 70	17 00	\$22 60
4	3 70	4 10	5 25	6 05	8 70	12 45	18 00	24 00
4 $\frac{1}{2}$	3 90	4 30	5 50	6 40	9 25	13 20	19 00	25 40
5	4 10	4 50	5 75	6 75	9 80	13 95	20 00	26 80
5 $\frac{1}{2}$	4 30	4 70	6 00	7 10	10 35	14 70	21 00	28 20
6	4 50	4 90	6 25	7 50	10 90	15 50	22 00	29 60
7			6 75	8 20	12 00	17 00	24 00	32 40
8			7 25	8 90	13 10	18 50	26 00	35 20
9			7 75	9 60	14 20	20 00	28 00	38 00
10				10 30	15 30	21 50	30 00	40 80
11				11 00	16 40	23 00	32 00	43 60
12				11 70	17 50	24 50	34 00	46 40

GIMLET-POINTED COACH SCREWS.

Same list price as coach screws.

WILL IT STICK?

YES, IT IS WARRANTED TO.

WHAT?

“MAC” TAPE.



# HOT PRESSED SQUARE AND HEXAGON NUTS.

Manufacturers' standard list.

Association list taking effect January 1, 1890.

Diameter, Inches.	Thick- ness, Inches.	Diameter of Hole, Inches.	Size of Bolt, Inches.	SQUARE NUTS, TAPPED.		HEXAGON NUTS, TAPPED.	
				Price per 100 lbs in 200-lb kegs.	Average number in 100 lbs.	Price per 100 lbs in 200-lb kegs.	Average number in 100 lbs.
$\frac{1}{8}$	$\frac{1}{4}$	$\frac{7}{8}$	$\frac{1}{4}$	\$19 00	7500	\$34 00	9250
$\frac{3}{8}$	$\frac{5}{8}$	$\frac{9}{8}$	$\frac{5}{8}$	15 50	4000	24 00	4500
$\frac{1}{2}$	$\frac{3}{4}$	$\frac{11}{8}$	$\frac{3}{4}$	10 70	2400	17 00	2700
$\frac{3}{4}$	$\frac{7}{8}$	$\frac{13}{8}$	$\frac{7}{8}$	8 00	1400	11 90	1700
1	$\frac{1}{2}$	$\frac{15}{8}$	$\frac{1}{2}$	6 90	1000	9 50	1100
$1\frac{1}{8}$	$\frac{9}{8}$	$\frac{17}{8}$	$\frac{9}{8}$	6 10	650	8 40	850
$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{19}{8}$	$\frac{1}{2}$	6 40	460	7 30	550
$1\frac{3}{4}$	$\frac{3}{4}$	$\frac{21}{8}$	$\frac{3}{4}$	5 70	280	6 60	400
$1\frac{1}{2}$	$\frac{7}{8}$	$\frac{23}{8}$	$\frac{7}{8}$	} 5 40 {	160	} 7 00 {	250
$1\frac{3}{4}$	1	$\frac{25}{8}$	1		110		200
2	$1\frac{1}{8}$	$\frac{27}{8}$	$1\frac{1}{8}$	} 5 90 {	78	} 6 80 {	110
$2\frac{1}{4}$	$1\frac{1}{4}$	$\frac{29}{8}$	$1\frac{1}{4}$		55		80
$2\frac{1}{2}$	$1\frac{3}{8}$	$\frac{31}{8}$	$1\frac{3}{8}$	6 30	43	7 20	60
$2\frac{3}{4}$	$1\frac{1}{2}$	$\frac{33}{8}$	$1\frac{1}{2}$	6 70	33	7 60	47
3	$1\frac{3}{4}$	$\frac{35}{8}$	$1\frac{3}{4}$	6 80	27	8 70	39
$3\frac{1}{4}$	$1\frac{7}{8}$	$\frac{37}{8}$	$1\frac{7}{8}$	9 20	25	9 10	29
$3\frac{1}{2}$	$1\frac{3}{4}$	$\frac{39}{8}$	$1\frac{3}{4}$	7 70	20	9 80	24
$3\frac{3}{4}$	2	$\frac{41}{8}$	2	7 90	14	10 20	25
4	$2\frac{1}{8}$	$\frac{43}{8}$	$2\frac{1}{8}$	8 80	-----	11 60	-----
$4\frac{1}{4}$	$2\frac{1}{4}$	2	$2\frac{1}{4}$	} 9 20 {	-----	} 12 00 {	-----
$4\frac{1}{2}$	$2\frac{3}{8}$	$2\frac{1}{8}$	$2\frac{3}{8}$		-----		-----
$4\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{1}{2}$	-----	-----	-----	-----
5	$2\frac{3}{4}$	$2\frac{1}{2}$	3	-----	-----	-----	-----

Left handed threads extra.

## IRON WASHERS.

Diameter, Inches.	Size of Hole, Inches.	Thickness of Wire Gauge.	Size of Bolt, Inches.	Price per lb in 200-lb kegs.	No. in 100 lbs.
$\frac{9}{16}$	$\frac{1}{4}$	18	$\frac{3}{16}$	\$0 23	-----
$\frac{3}{4}$	$\frac{5}{8}$	16	$\frac{1}{4}$	12	13900
$\frac{7}{8}$	$\frac{3}{4}$	16	$\frac{5}{8}$	10	11250
1	$\frac{7}{8}$	14	$\frac{3}{4}$	8	5450
$1\frac{1}{8}$	$\frac{1}{2}$	14	$\frac{7}{8}$	6	2600
$1\frac{1}{4}$	$\frac{9}{8}$	12	$\frac{1}{2}$	5	2000
$1\frac{3}{8}$	$\frac{1}{2}$	12	$\frac{9}{8}$	} 4 {	1700
$1\frac{1}{2}$	$\frac{1}{2}$	10	$\frac{1}{2}$		1310
$1\frac{3}{4}$	$\frac{1}{2}$	10	$\frac{3}{4}$		1001
2	$\frac{1}{2}$	10	$\frac{3}{4}$		860
$2\frac{1}{4}$	$\frac{1}{2}$	9	$\frac{7}{8}$	} 5 {	625
$2\frac{1}{2}$	$1\frac{1}{8}$	9	1		520
$2\frac{3}{4}$	$1\frac{1}{4}$	9	$1\frac{1}{8}$		400
3	$1\frac{1}{4}$	9	$1\frac{1}{4}$		-----
$3\frac{1}{4}$	$1\frac{3}{8}$	8	$1\frac{3}{8}$	} 5 {	280
$3\frac{1}{2}$	$1\frac{1}{2}$	8	$1\frac{1}{2}$		240
$3\frac{3}{4}$	$1\frac{5}{8}$	8	$1\frac{5}{8}$		220
4	$1\frac{3}{4}$	8	$1\frac{3}{4}$		-----
$4\frac{1}{4}$	$1\frac{7}{8}$	8	$1\frac{7}{8}$	} 5 {	175
$4\frac{1}{2}$	2	8	2		-----



# MALLEABLE IRON BRACKETS.



No. 1006



No. 1004



No. 1005



No. 1002.



No. 1014.



No. 1013.



No. 1009



No. 1018



No. 1001.



No. 1008.



No. 1017.



No. 1007.



No. 1012.



No. 1011



No. 1015.



No. 1016.



No. 1010.

Trade Word.	List No.	Factory No.	Price.
Religious	867	1006	each \$0 50
Relinquent	865	1004	" 50
Relinquish	866	1005	" 50
Reliquary	882	1002	" 50
Relique	868	1014	" 40
Relish	872	1013	" 30
Reloan	869	1009	" 25
Reluct	870	1018	" 15
Reluctant	878	1001	" 55
Reluctate	876	1008	" 30
Relume	881	1017	" 50
Remade	875	1007	" 30
Remain	873	1012	" 30
Remand	874	1011	" 30
Remanent	877	1015	" 30
Remark	880	1016	" 60
Remarkable	879	1010	" 30
Remarked	871	---	" 26
		Iron pin	



## GUARD ARMS.

These guards act as an additional support when properly placed, when line wires turn sharp angles.

The curved pattern is to be used where line wire takes oblique turns, and the straight patterns for right-angled turns.

Trade Word.	List No.			Price.
Remarker	845	Straight guard arm	each	\$0 24
Remarried	846	Curved " "	"	27

## HOOK AND EYE TURN BUCKLES.

Iron galvanized. Also made with two eyes.

Trade Word.	List No.			Plain Price.	Galvanized Price.
Remast	847	$\frac{3}{16}$	each	\$0 80	\$0 95
Remble	848	$\frac{1}{4}$	"	85	1 00
Remedial	849	$\frac{5}{16}$	"	90	1 10
Remediate	850	$\frac{3}{8}$	"	1 10	1 30
Remedy	851	$\frac{7}{16}$	"	1 25	1 50
Remelt	852	$\frac{1}{2}$	"	1 55	1 80
Rememorate	853	$\frac{9}{16}$	"	1 85	2 10
Remercie	854	$\frac{5}{8}$	"	2 00	2 40
Remigrate	855	$\frac{3}{4}$	"	2 75	3 50

## INSULATED TURN BUCKLE.



Galvanized wrought iron, with porcelain insulators. Made both single and double. The single has an insulator at one end and an eye at the other. The double has insulators at both ends.

Trade Word.	List No.				Price.
Remind	856	$\frac{3}{8}$ in. diam.	Single, with 6 in. take-up	each	\$1 50
Remiped	857	$\frac{3}{8}$ " "	Double, " 6 " "	"	1 75
Remise	858	$\frac{1}{2}$ " "	Single, " 9 " "	"	2 00
Remission	859	$\frac{1}{2}$ " "	Double, " 9 " "	"	2 25

GOOD AS THE BEST.

CHEAPEST OF HIGH CLASS STICKERS.

"MAC" TAPE.

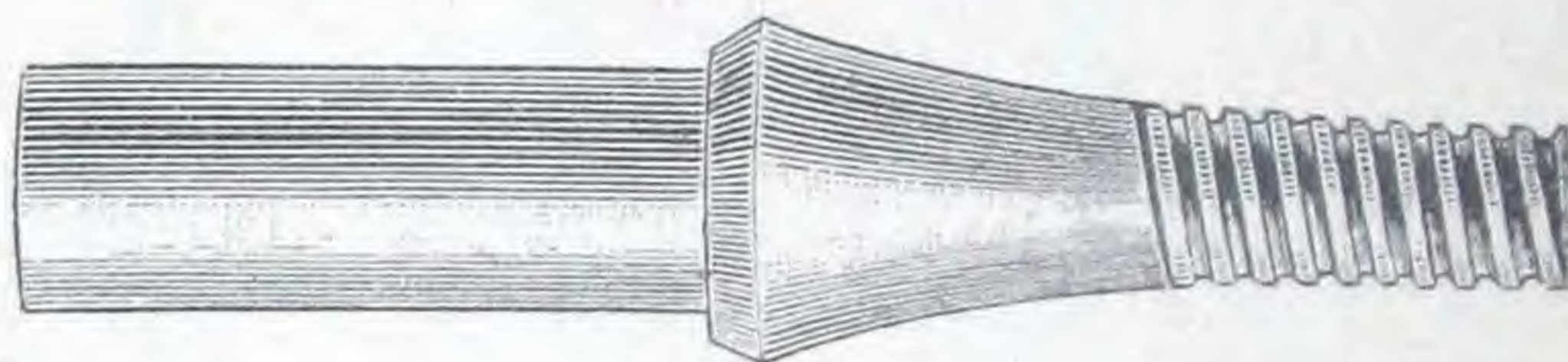


## OAK PINS.



Trade Word.	List No.			Price
Remodel	860	Painted 1½ inch	per 1000	\$15 00
Remold	861	" 1¼ "	" "	13 00

## LOCUST PINS.



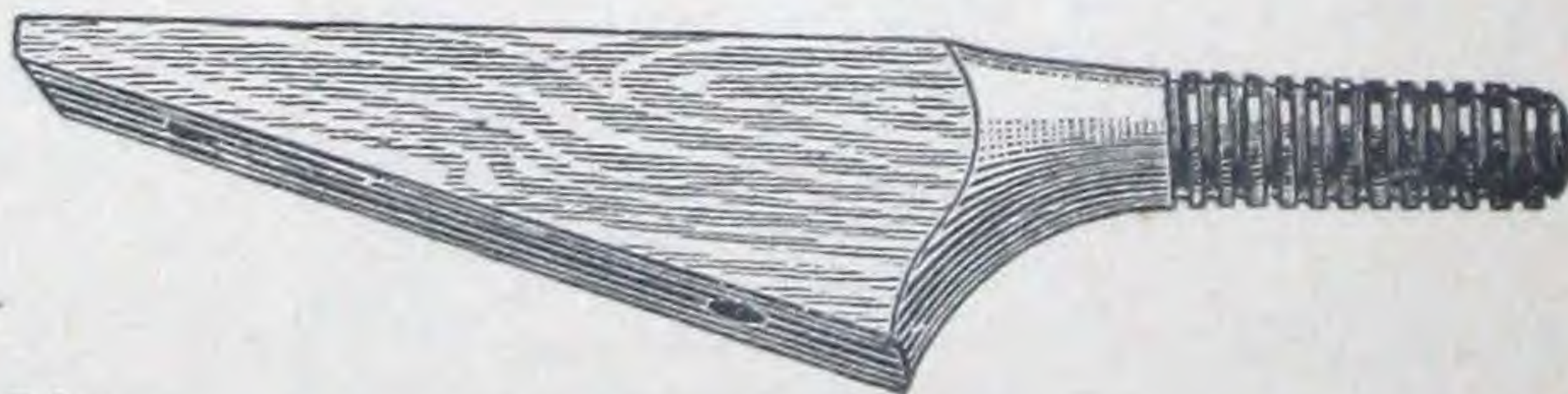
Trade Word.	List No.			Price.
Remolding	862	Unpainted 1½ inch	per 1000	\$30 00

## CORNER PINS.



Trade Word.	List No.			Price.
Remora	863	1½ inch split oak, painted, with bolt and washer complete	per 1000	\$60 00

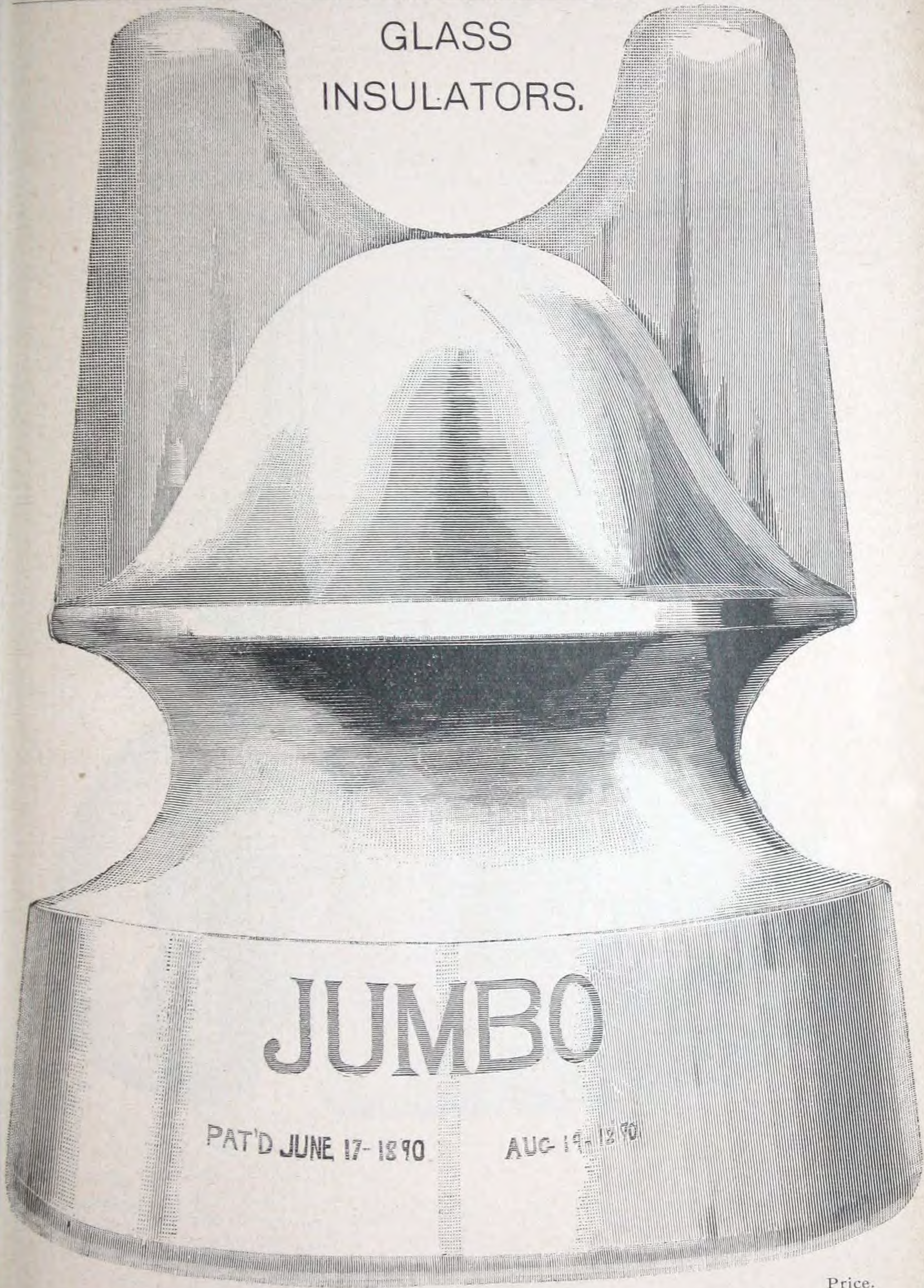
## OAK BRACKET.



Trade Word.	List No.			Price.
Remord	865	Painted	per 1000	\$25 00



# GLASS INSULATORS.

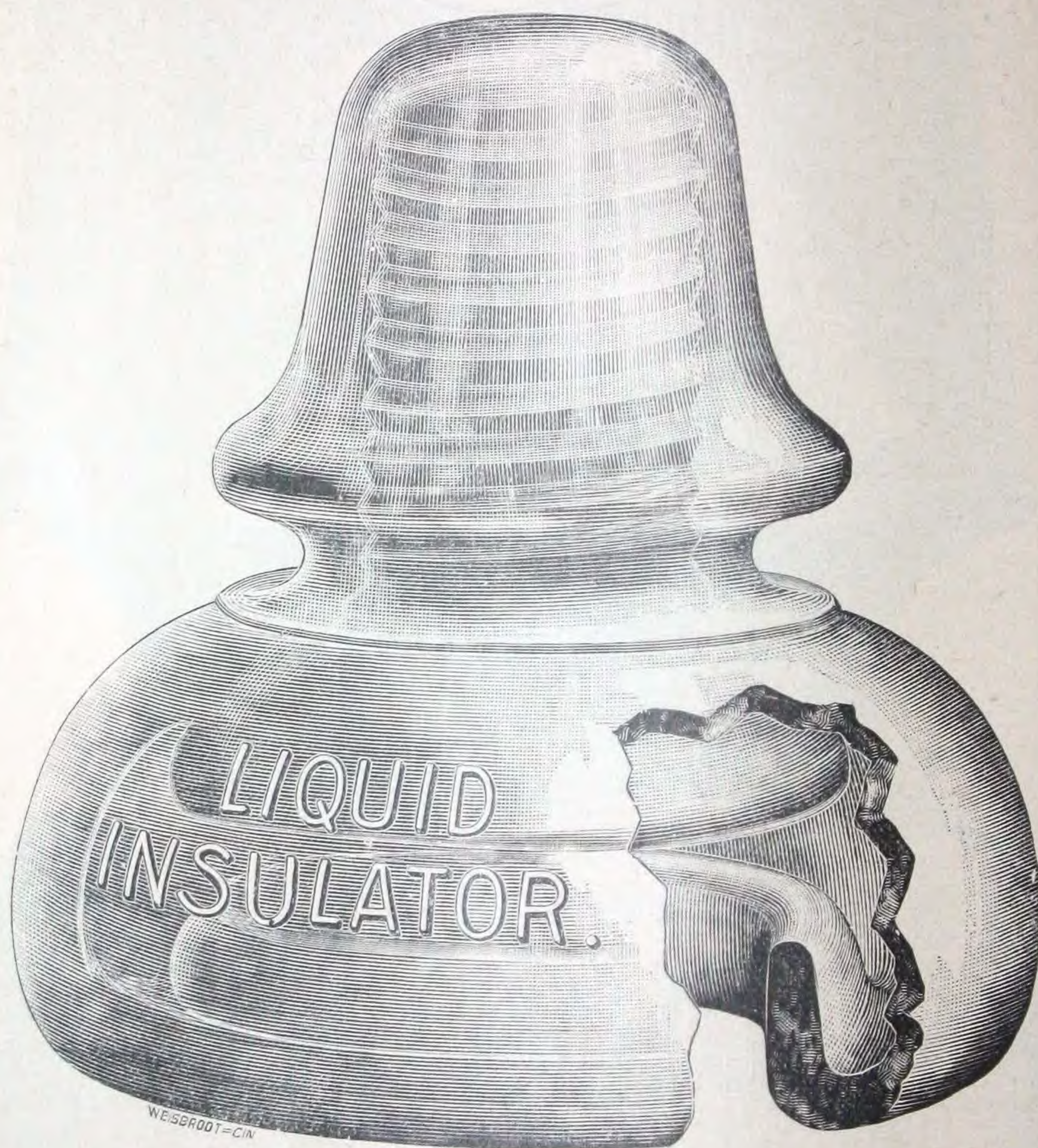


Trade Word. List No.  
Remorate 3884  
Diameter 5 inches, height 7 inches, weight about 6 lbs.

Price.  
per 100 \$50 00



## GLASS INSULATORS—Continued.



Trade  
Word.  
Remorse

List  
No.  
3286

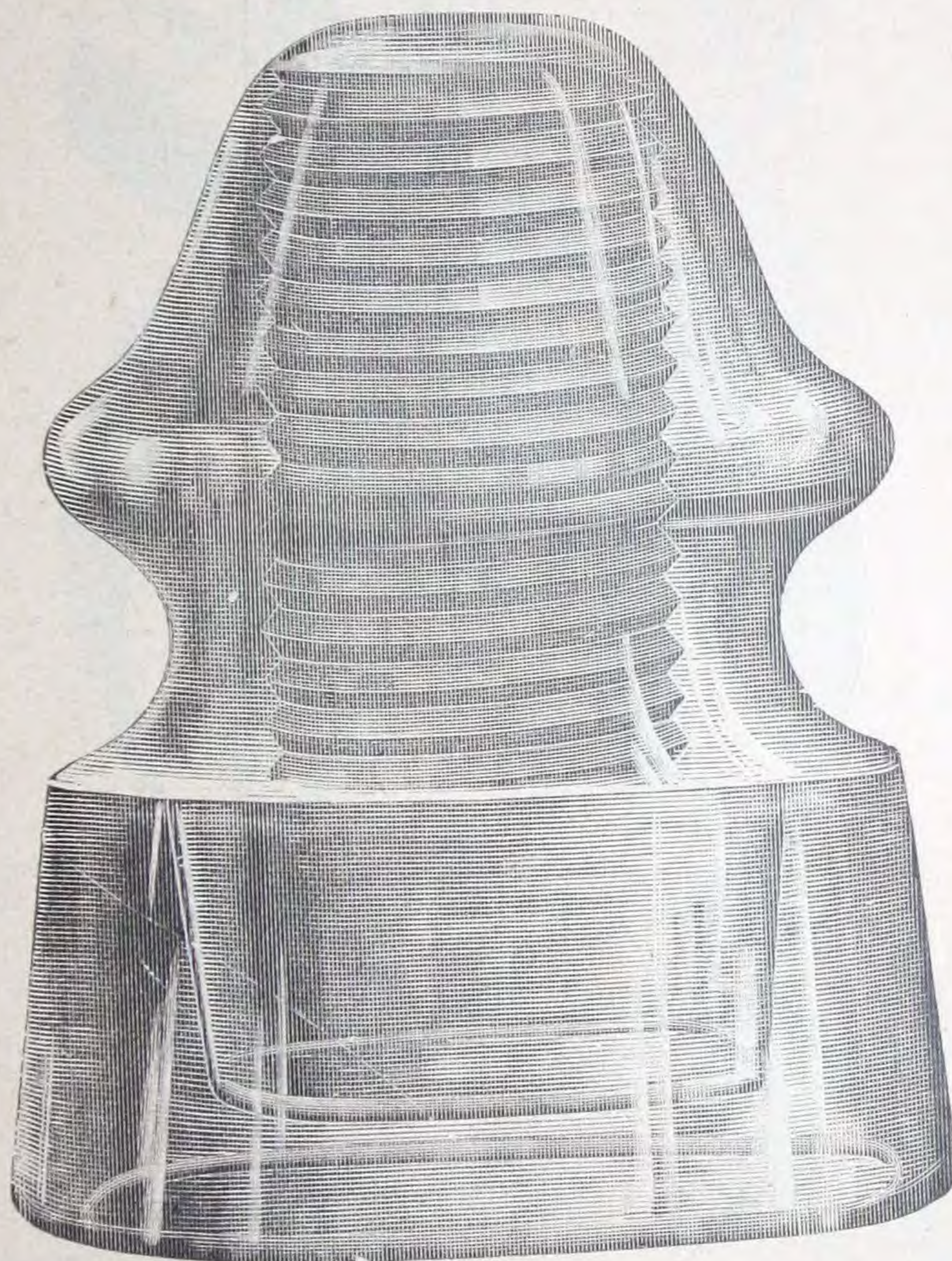
Price.

per 100 \$64 00



## GLASS INSULATORS—Continued.

## STREET RAILWAY DOUBLE PETTICOAT DEEP GROOVE.

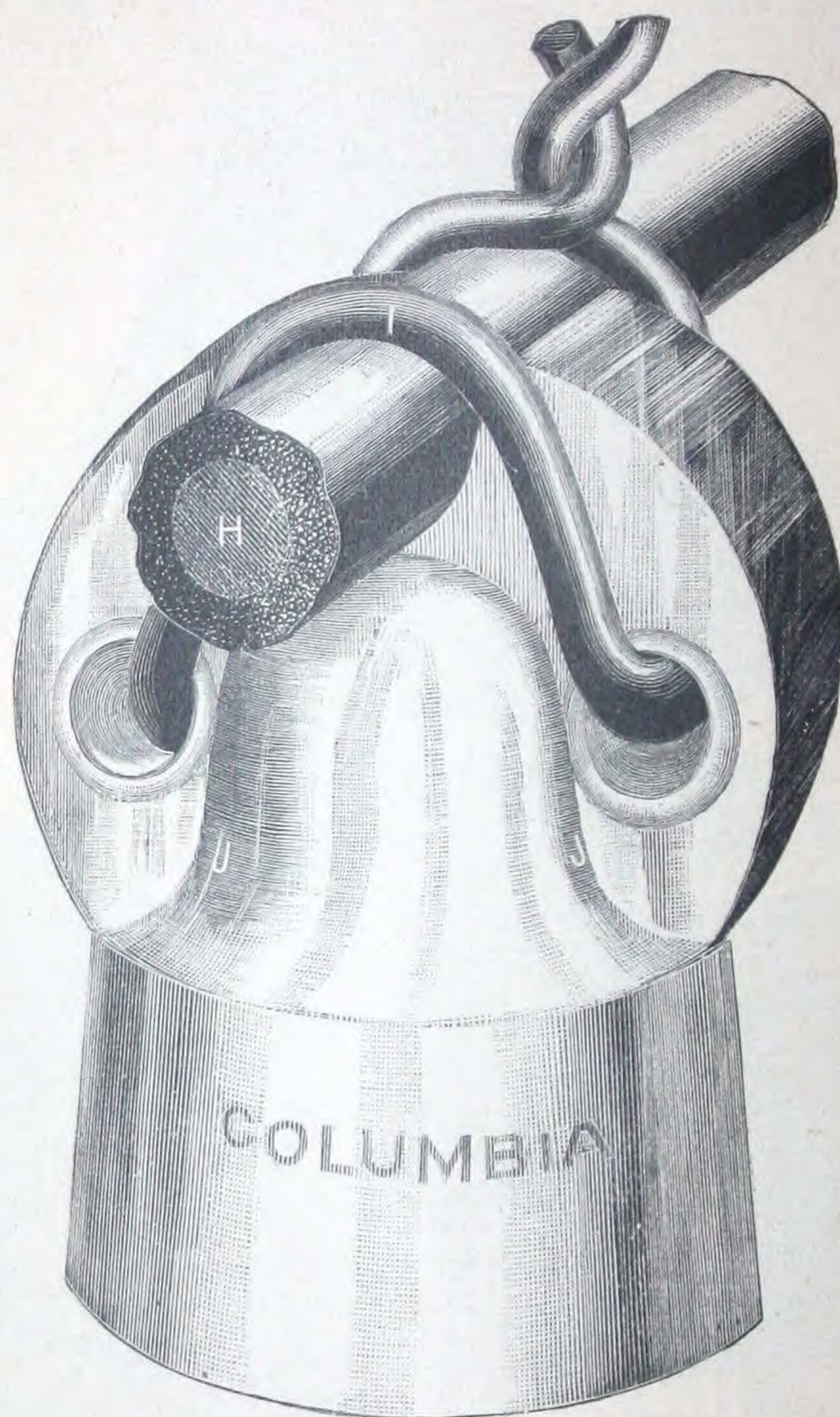


Trade Word.	List No.		Price.
Remorseful	904	Street railway double petticoat deep groove per 1000	\$70 00
Remote	903	Double petticoat deep groove	65 00
Remotion	902	Deep groove	55 00
Removal	901	Regular, No. 3	50 00
Remphan	900	Pony double petticoat deep groove	45 00
Remurmur	899	Pony	40 00



## GLASS INSULATORS—Continued.

## THE COLUMBIA.



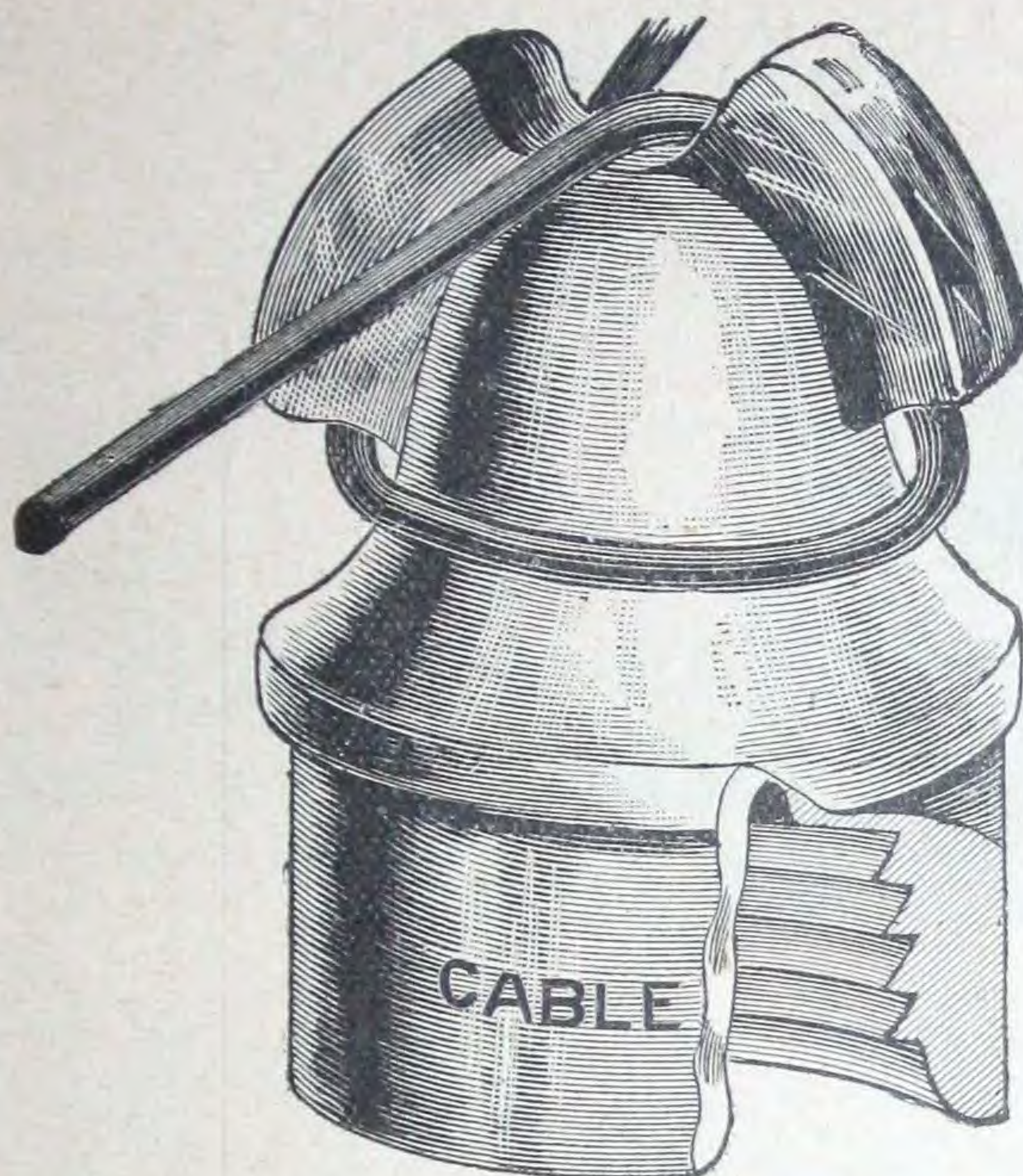
For  $1\frac{1}{4}$  inch cables. This cut shows the CABLE in the saddle and the tie wires passing through the holes in the insulator. The cable may be carried on the shoulder and secured through the holds.

Cut one-half size, weighs  $2\frac{3}{4}$  lbs.

Trade Word.	List No.	Price.
Renard	3885	per 100 \$17 15



## GLASS INSULATORS—Continued.



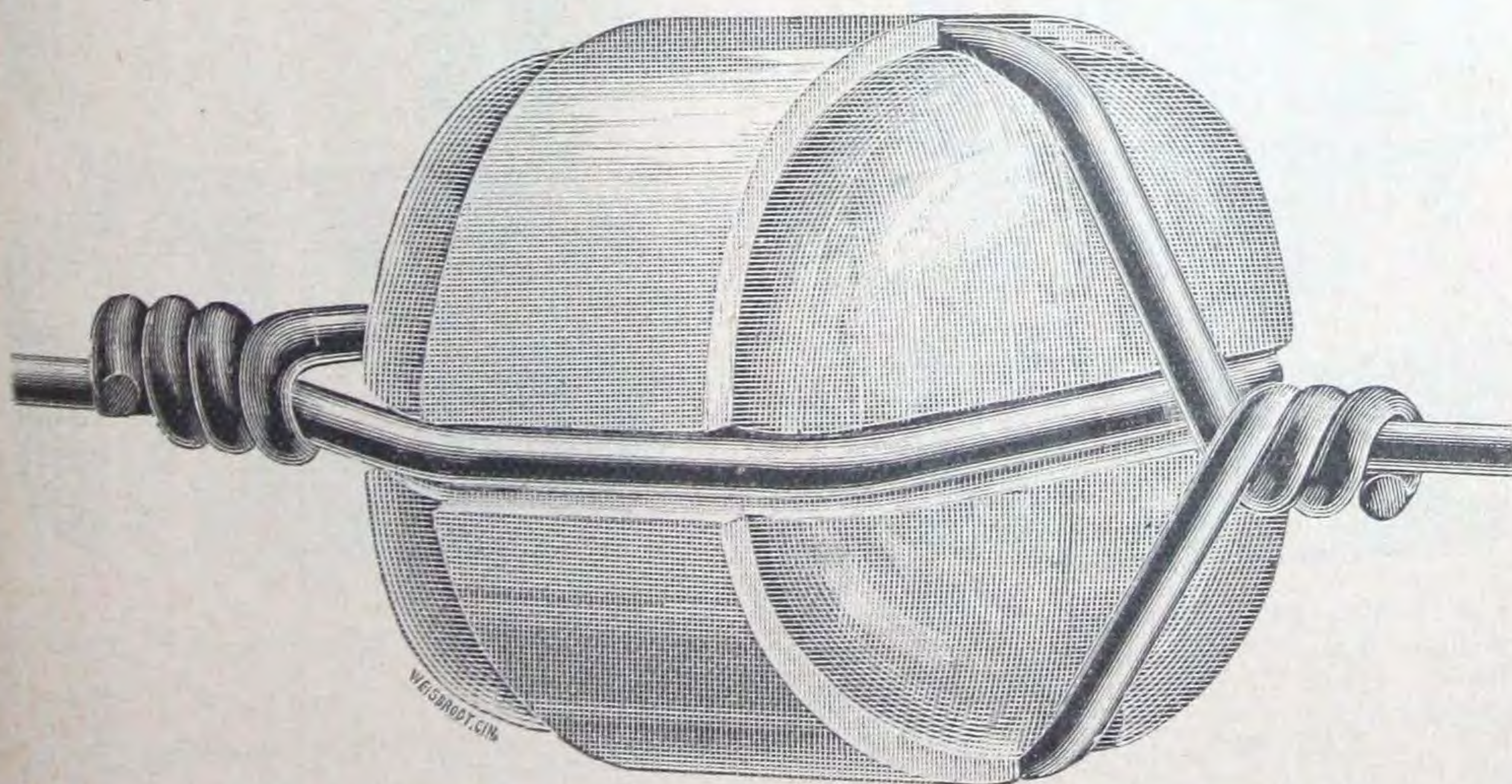
Trade  
Word.  
Renegado

List  
No.  
3886

Price.  
\$8 55

per 100

## CIRCUIT BREAK.



Trade  
Word.  
Renovate

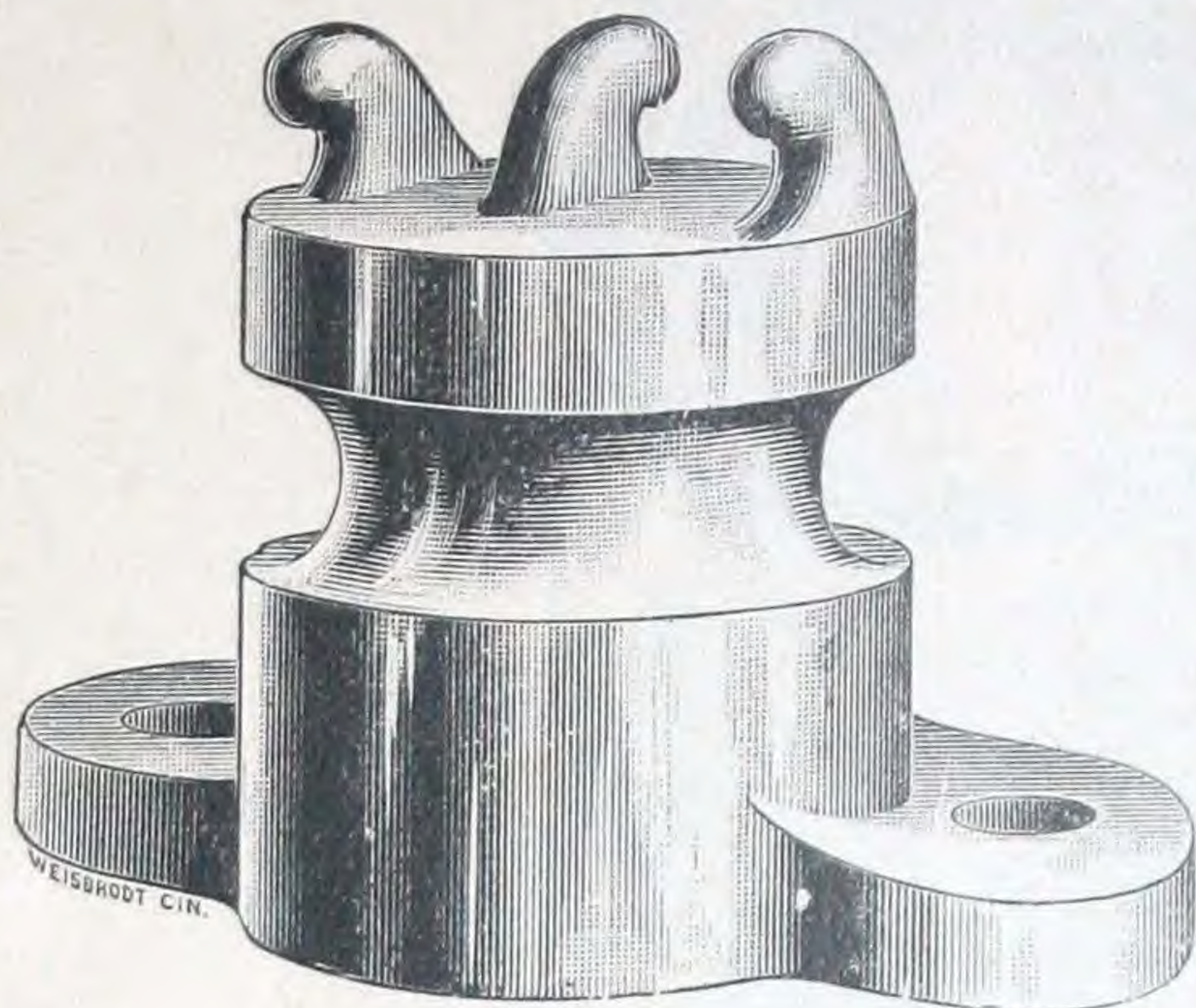
List  
No.  
3887

Price.  
\$8 00

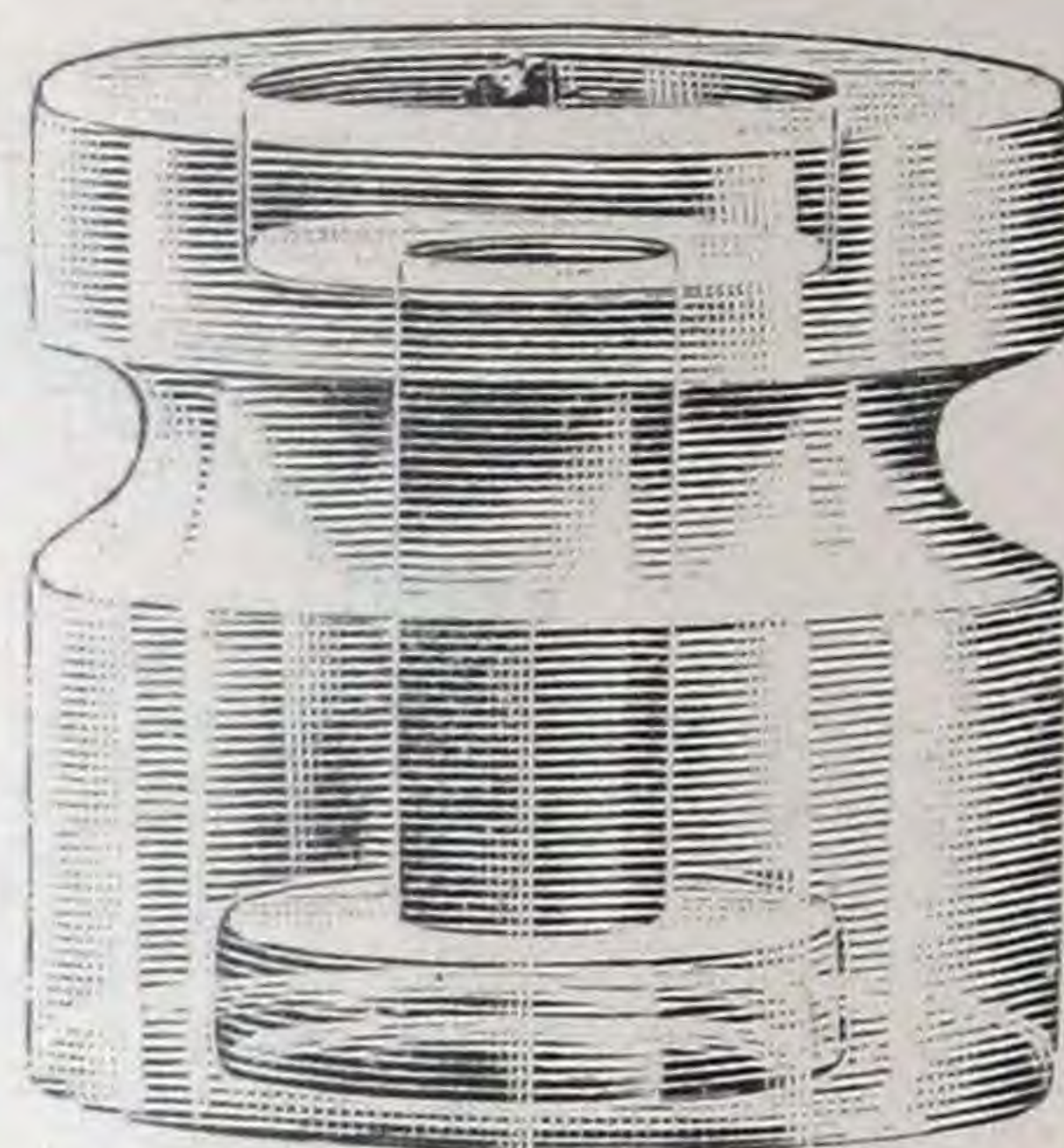
per 100



# GLASS INSULATING KNOBS.

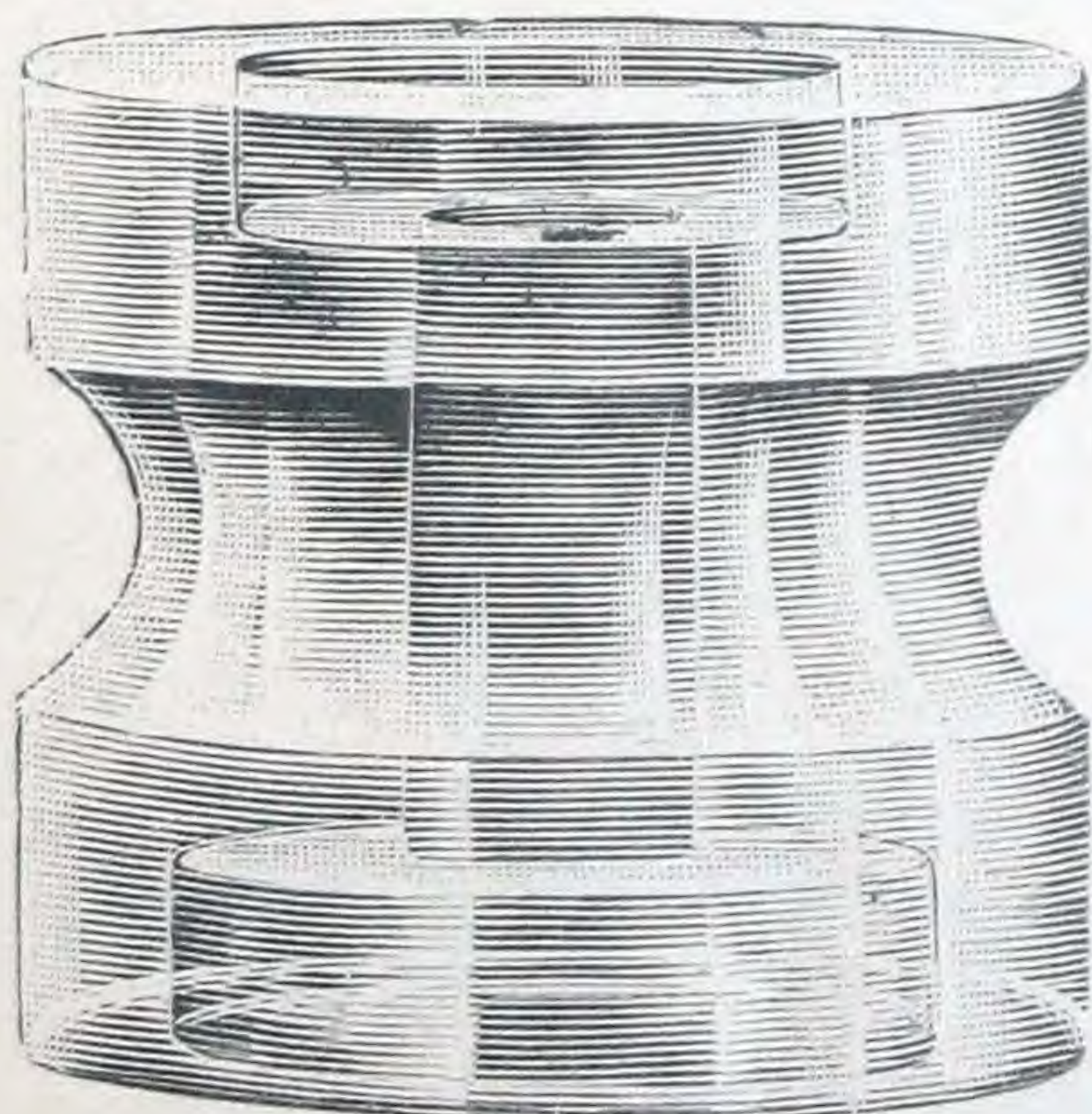


Trade Word.	List No.		Price.
Renown	3305	For up to No. 10 wire	
		-----per 1000	\$50 00
Renter	3306	For up to No. 6 wire	
		-----per 1000	60 00



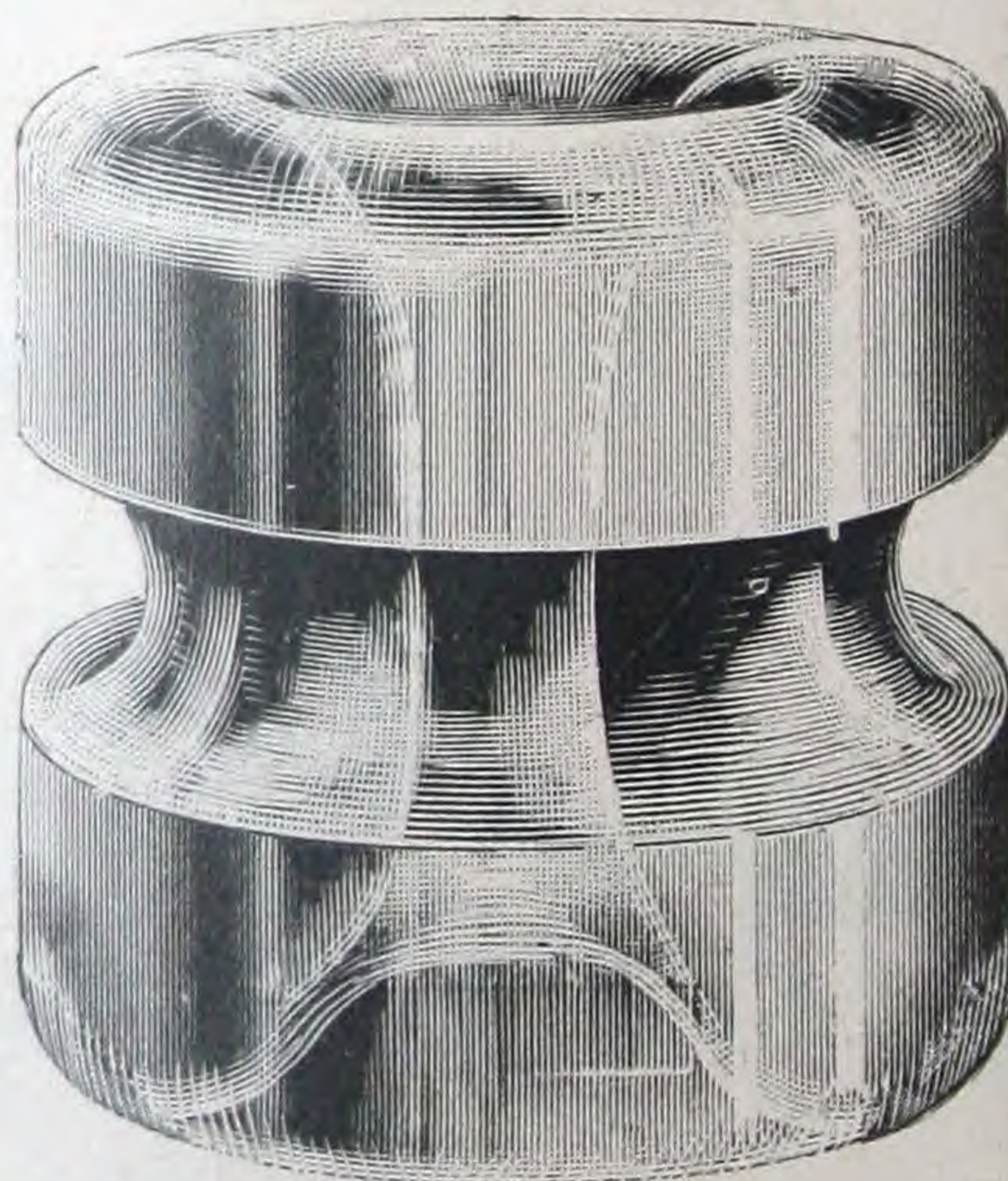
1½ in. long, 1½ in. wide, ⅜ in. hole.

Trade Word.	List No.		Price.
Reobtain	908	-----per 1000	\$30 00



1¼ in. long, 2 in. wide, ½ in. hole.

Trade Word.	List No.		Price.
Reordain	909	-----per 1000	\$40 00

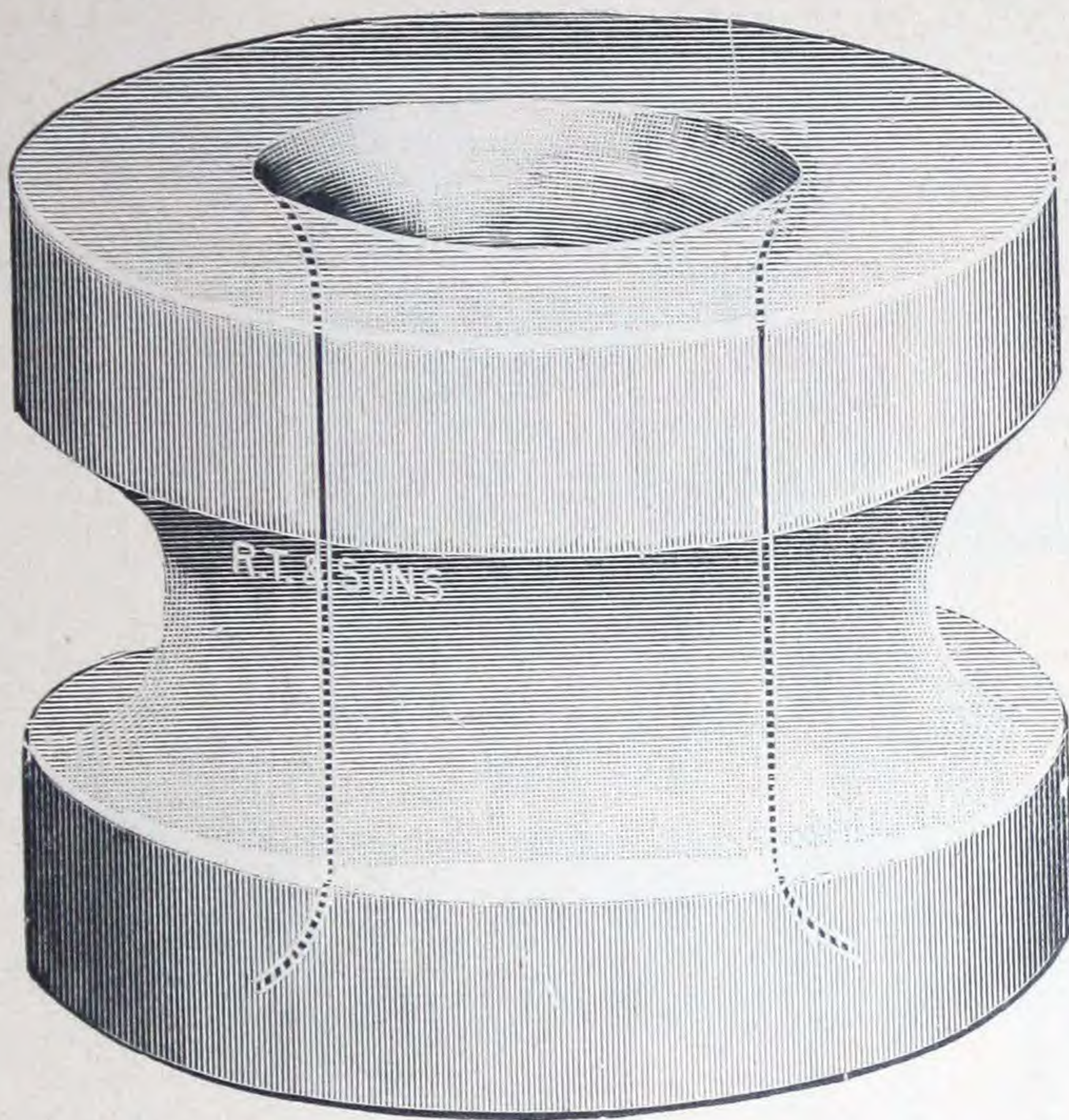


2¼ in. long, 2 in. wide, ⅜ in. hole.

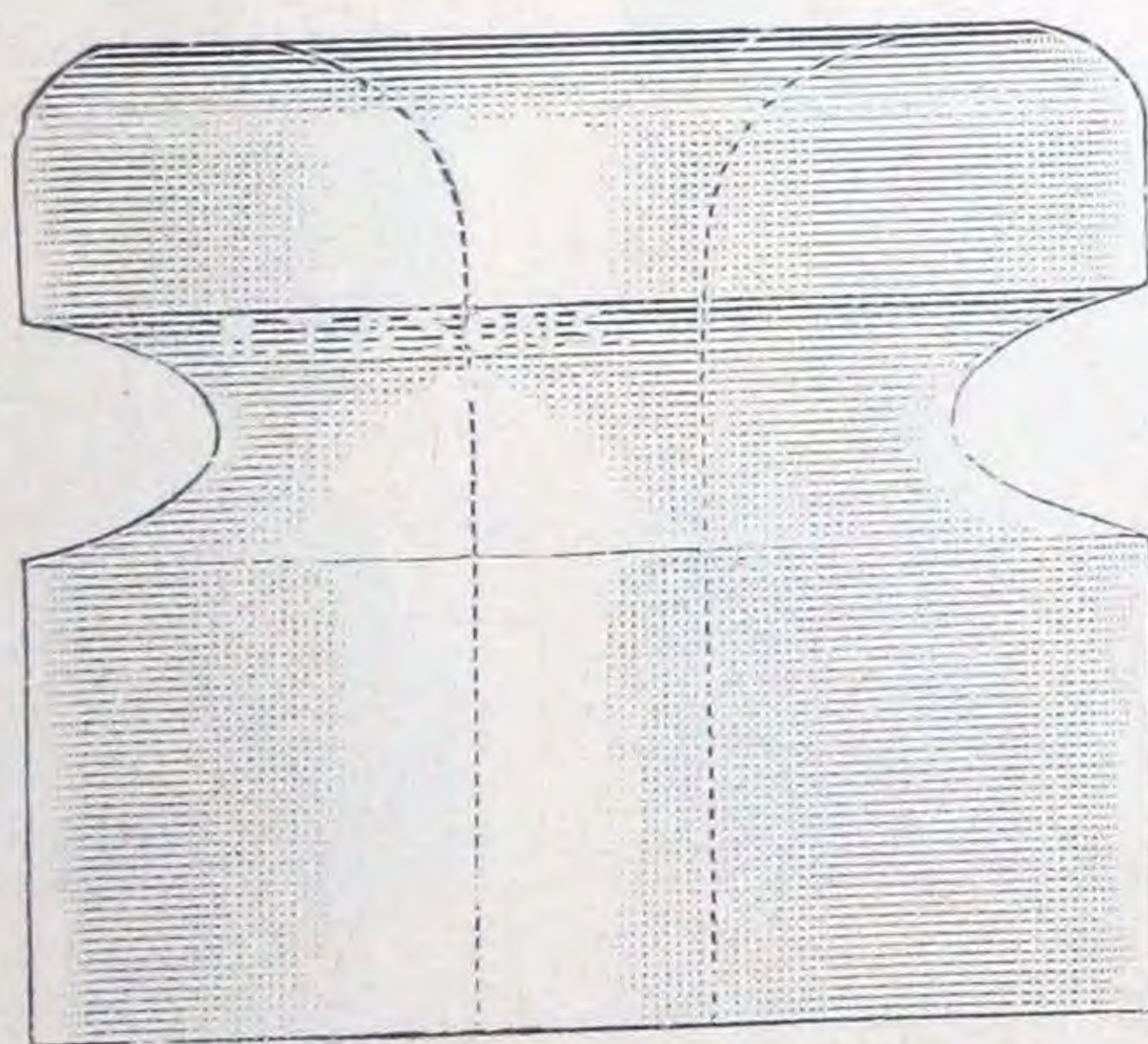
Trade Word.	List No.		Price.
Repand	910	-----per 1000	\$50 00



# PORCELAIN INSULATORS.



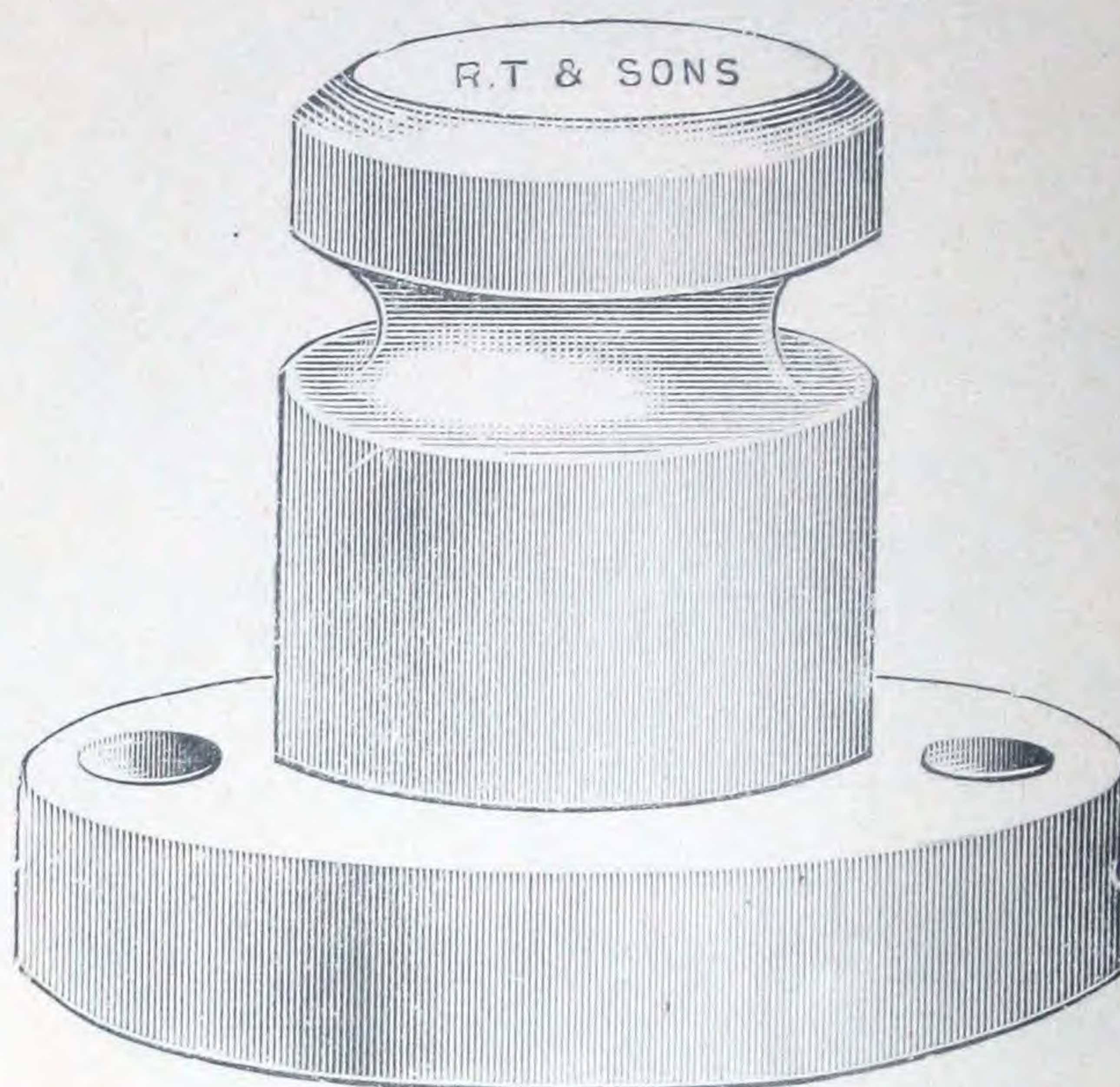
Trade Word.	List No.	Insulators	per 1000	Price.
Repartee	973	Insulators	per 1000	\$175 00



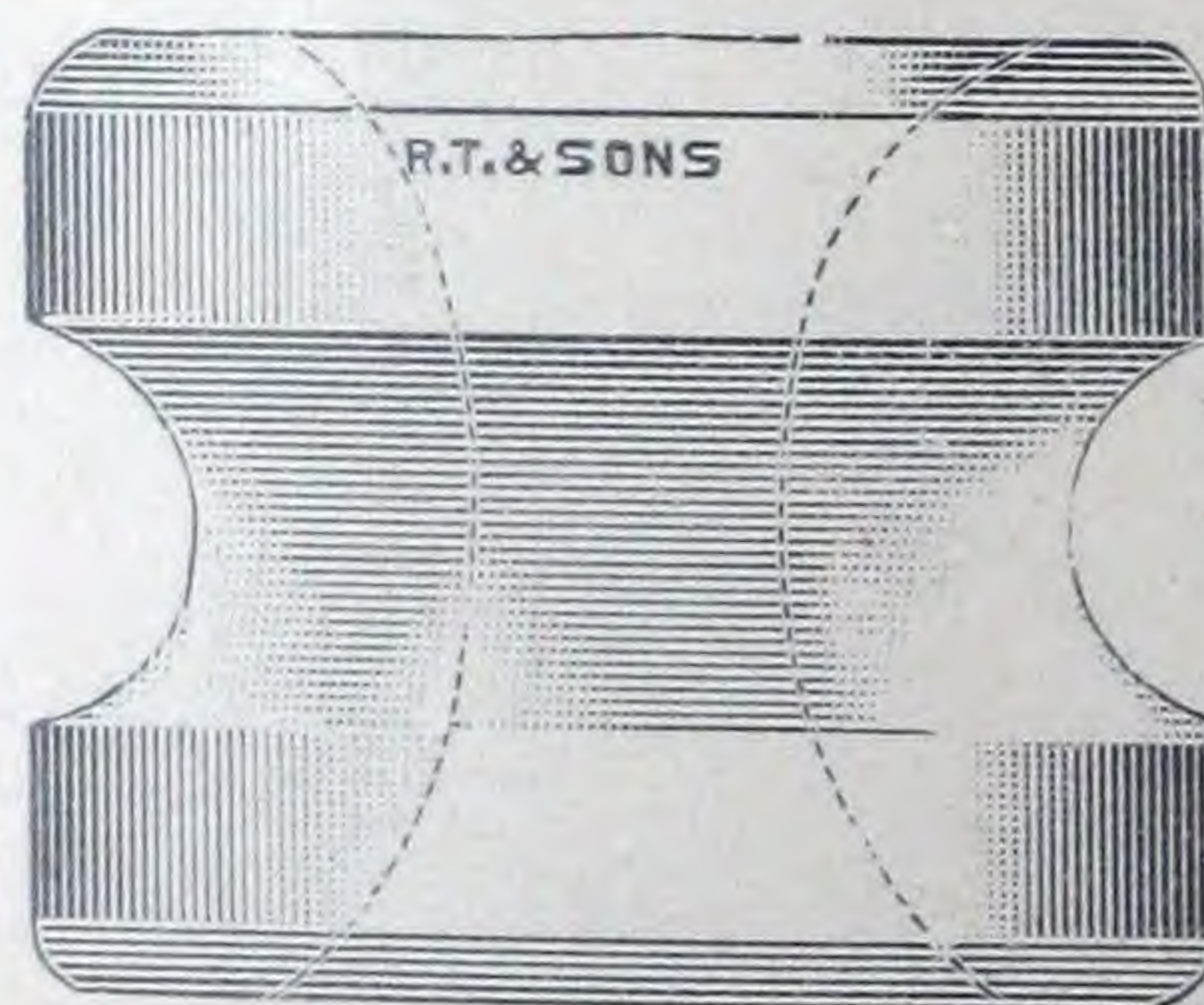
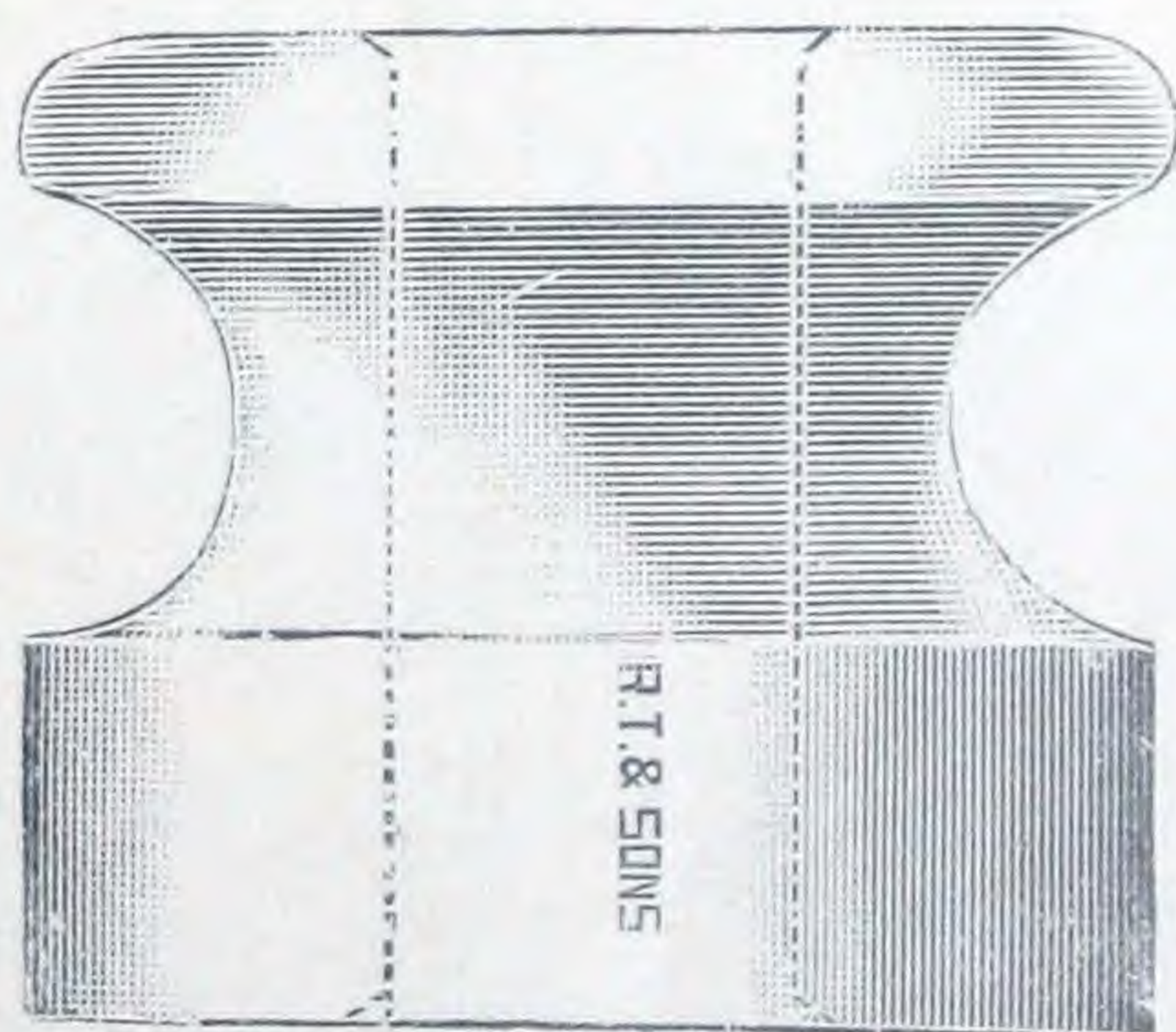
Trade Word.	List No.	Insulators	per 1000	Price.
Repass	976	Insulators	per 1000	\$30 00
Repasture	977	" (Regular No. 4)	" "	15 00



# PORCELAIN INSULATORS—Continued.



Trade Word.	List No.		Price.
Repealed	993	Insulators .....	per 1000 \$60 00

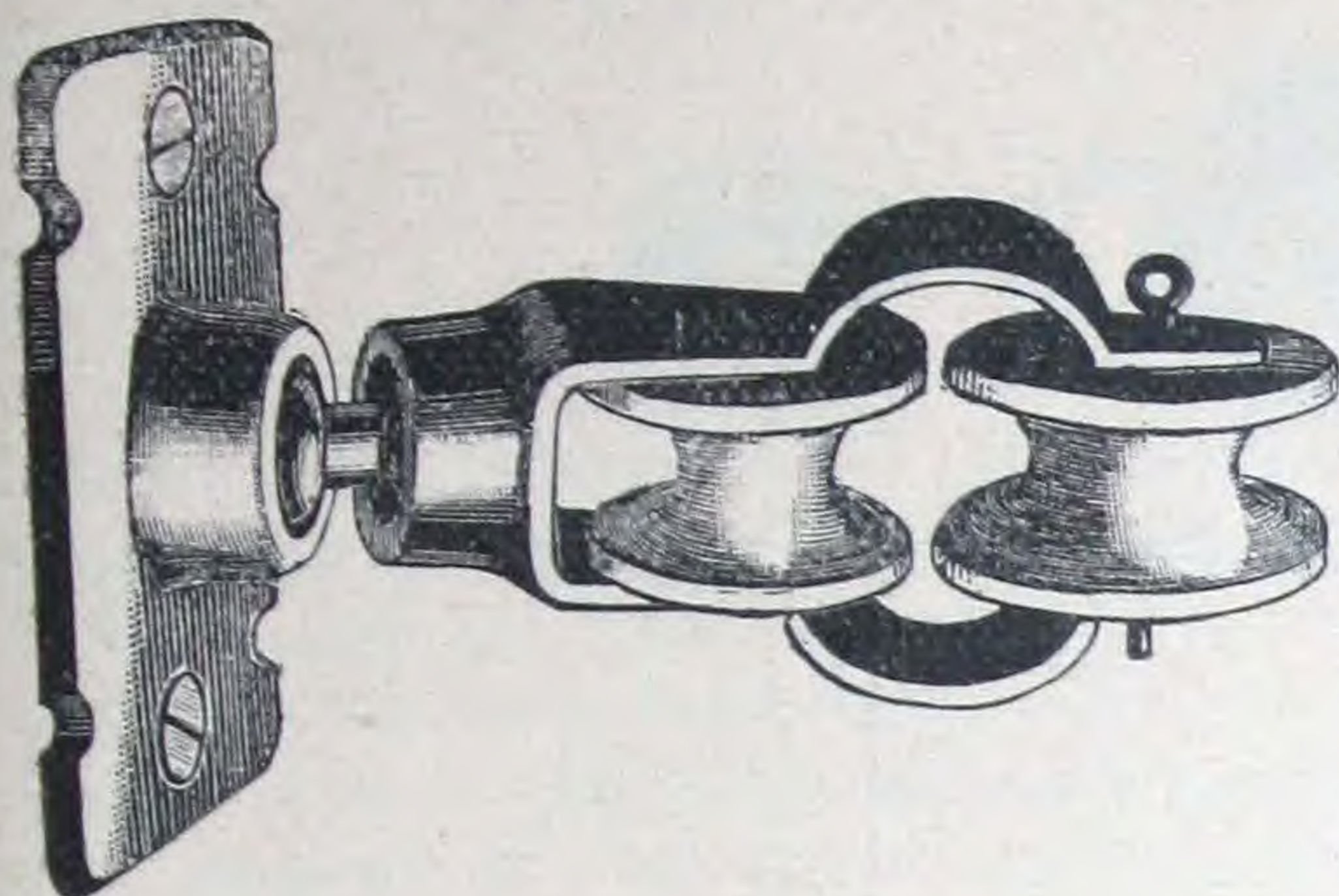


Trade Word.	List No.	Price.	Trade Word.	List No.	Price.
Repredation	994	Insulators.....per 1000 \$50 00	Repellant	995	Insulators.....per 1000 \$22 00

We have all kinds of insulators in stock and issue special catalogue of same, write for it.



## SWIVEL TREE INSULATOR.



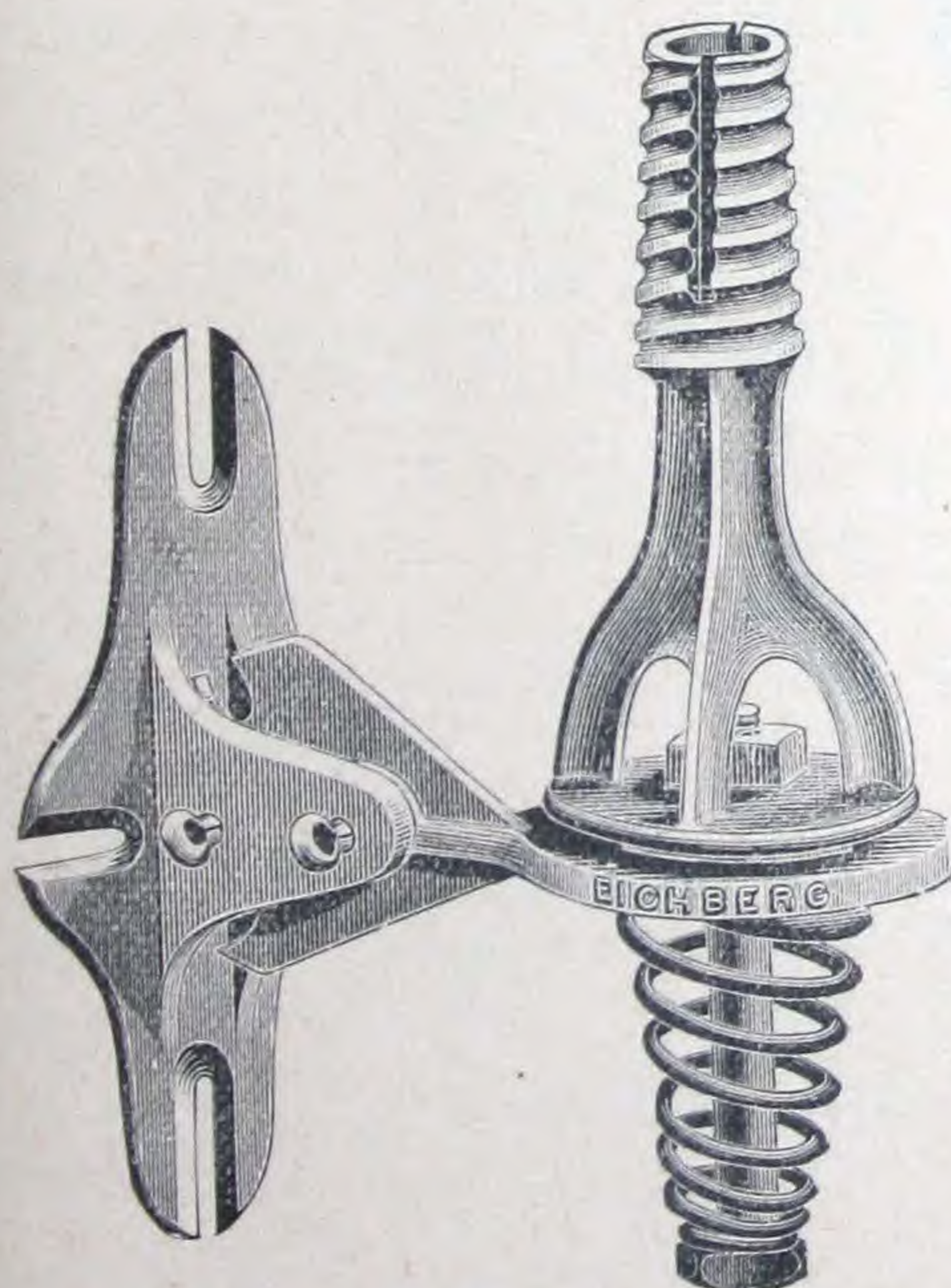
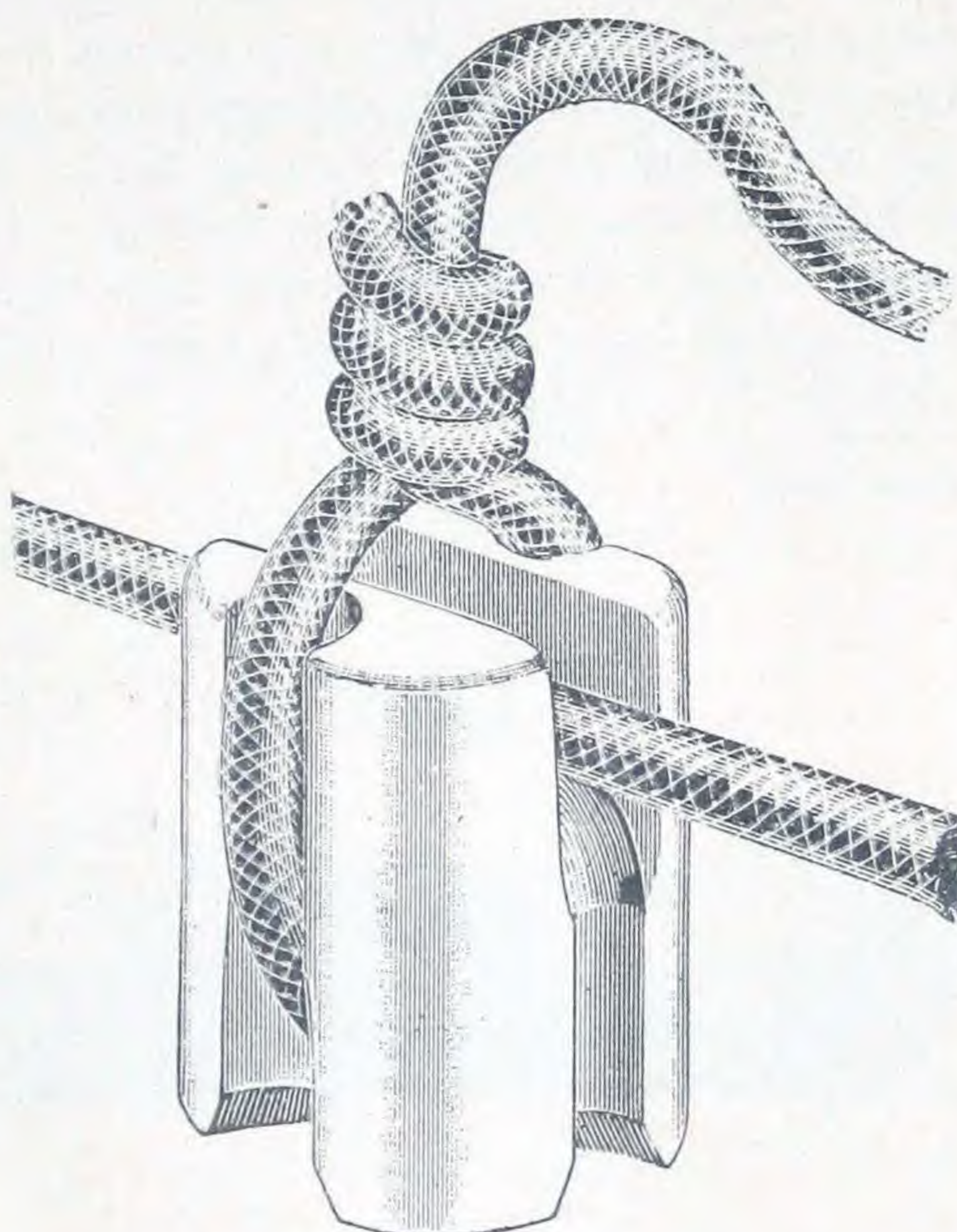
Trade  
Word.  
Repeople

List  
No.  
932

Price.  
each \$0 40

## P. & S. CIRCUIT BREAKER.

Trade Word.	List No.	Price.
Repercuss	923 Small size, 1 $\frac{3}{4}$ in. long --- per 100	\$10 00
Repertory	924 Large size, 2 $\frac{1}{2}$ in. long --- per 100	13 00

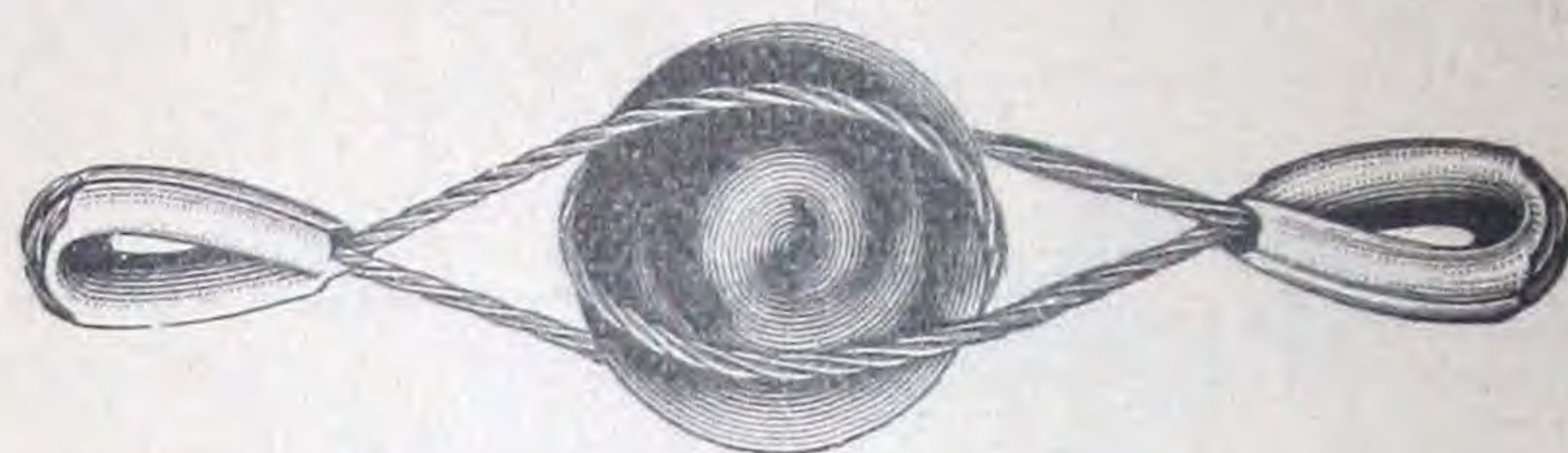


## THE EICHBERG TREE INSULATOR.

Trade Word.	List No.	Price.
Repercussion	3985	each \$1 00



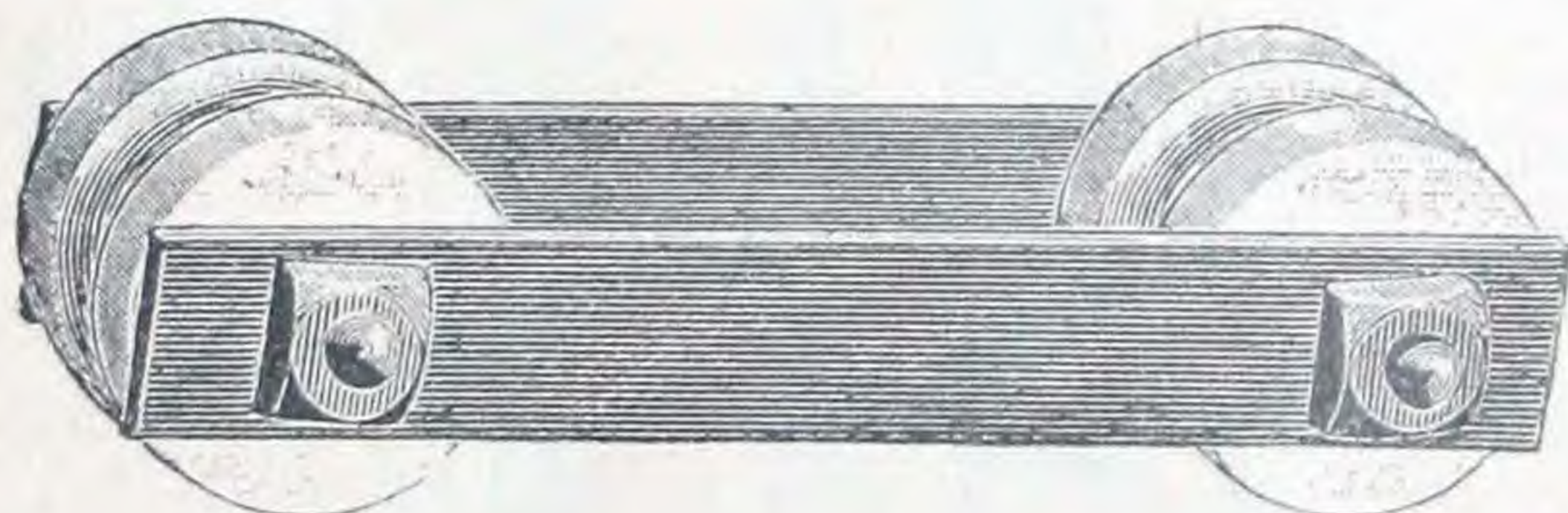
## M. E. STRAIN INSULATOR.



The insulator shown in the accompanying illustration is designed for insulating span wires on overhead construction of electrical railways, and is, as well, adapted for suspending arc lamps and similar work where high insulation, strength and durability is desired. It is also suitable for cutting in as circuit breaker on arc lines. The ball is made of the toughest green glass, three inches in diameter with two grooves running part way around the ball at right angles. To this is attached interlocking loops made of seven-strand Gale steel wire, dipped in P. & B. insulating compound, thereby insuring high insulation. At either end of the steel wire is fastened a malleable iron casting. The insulator will stand a strain of 6,000 pounds, and will withstand the extreme changes of weather without deterioration, at the same time maintaining high insulation.

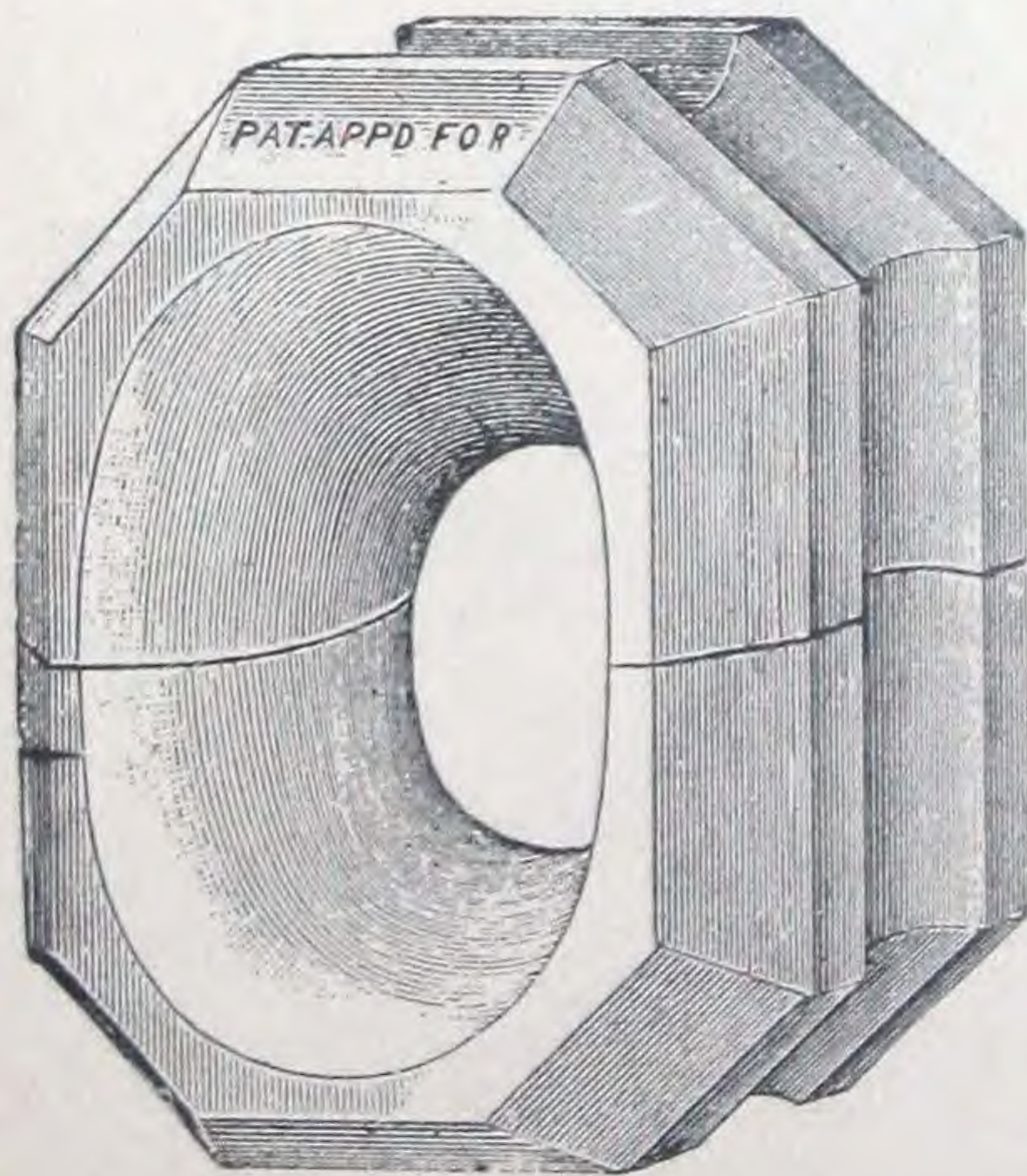
Trade Word.	List No.		Price.
Repetend	3034	-----each	\$1 50

## CIRCUIT LOOP BREAK.



Trade Word.	List No.		Price.
Replait	925	-----each	\$0 35

## THE VICTOR SPLIT INSULATOR.



Trade Word.	List No.		Price
Replead	926	Insulators -----per 100	\$10 00
Replenish	927	2 inch hangers "	4 50
Replete	928	6 " " " "	5 00



## THE STANDARD STOVE.

STREET RAILWAY MEN know a practical thing when they see it, and still better when they have used it.

### THE STANDARD STOVE

is a practical thing because the street railway men who have bought it say so; they have used it.

YOU DO NOT HAVE TO CUT YOUR CARS TO INSTALL IT.

The stove case, with stove, is placed on the seat. The only stove that can be used without damaging the car.

BOXES LINED THROUGHOUT.

PERFECT IN EVERY PARTICULAR.

Impossible to injure cushions. Can be used on seats of every description. Entire stove is cast iron. You can sit close to the box without discomfort from excessive heat.

HAS LARGEST ASH PAN OF ANY STOVE MADE.

Our stove occupies but half the space required by stoves resting on the floor.

We guarantee to heat cars as well, and better than any such stove in the market.

IT IS AN ORNAMENT TO ANY CAR.





THIS  
IS  
THE  
STANDARD.

THE  
NUMBER  
IN  
USE  
PROVE  
IT.

Trade  
Word.  
Replevin

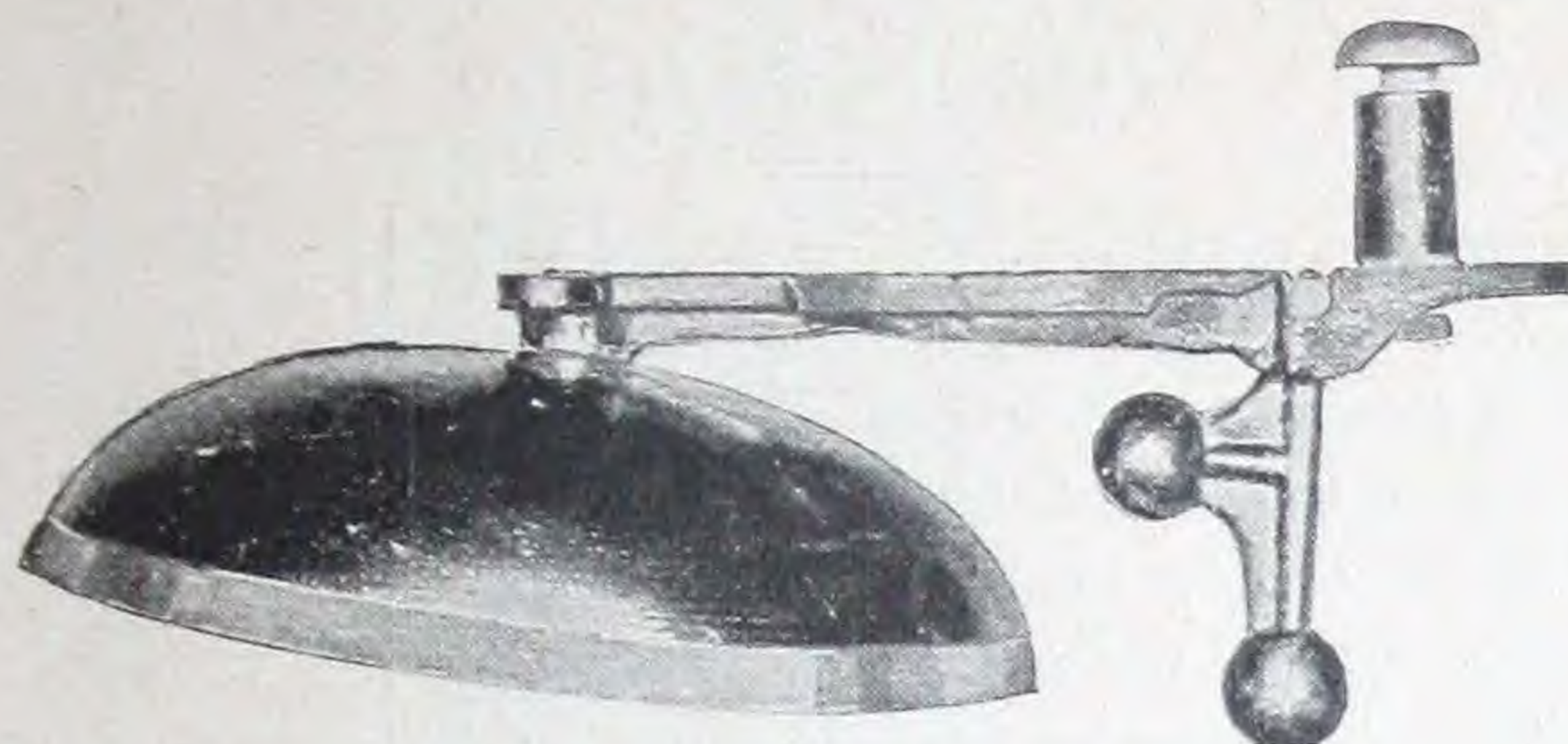
List  
No.  
3888

Price.  
each \$25 00

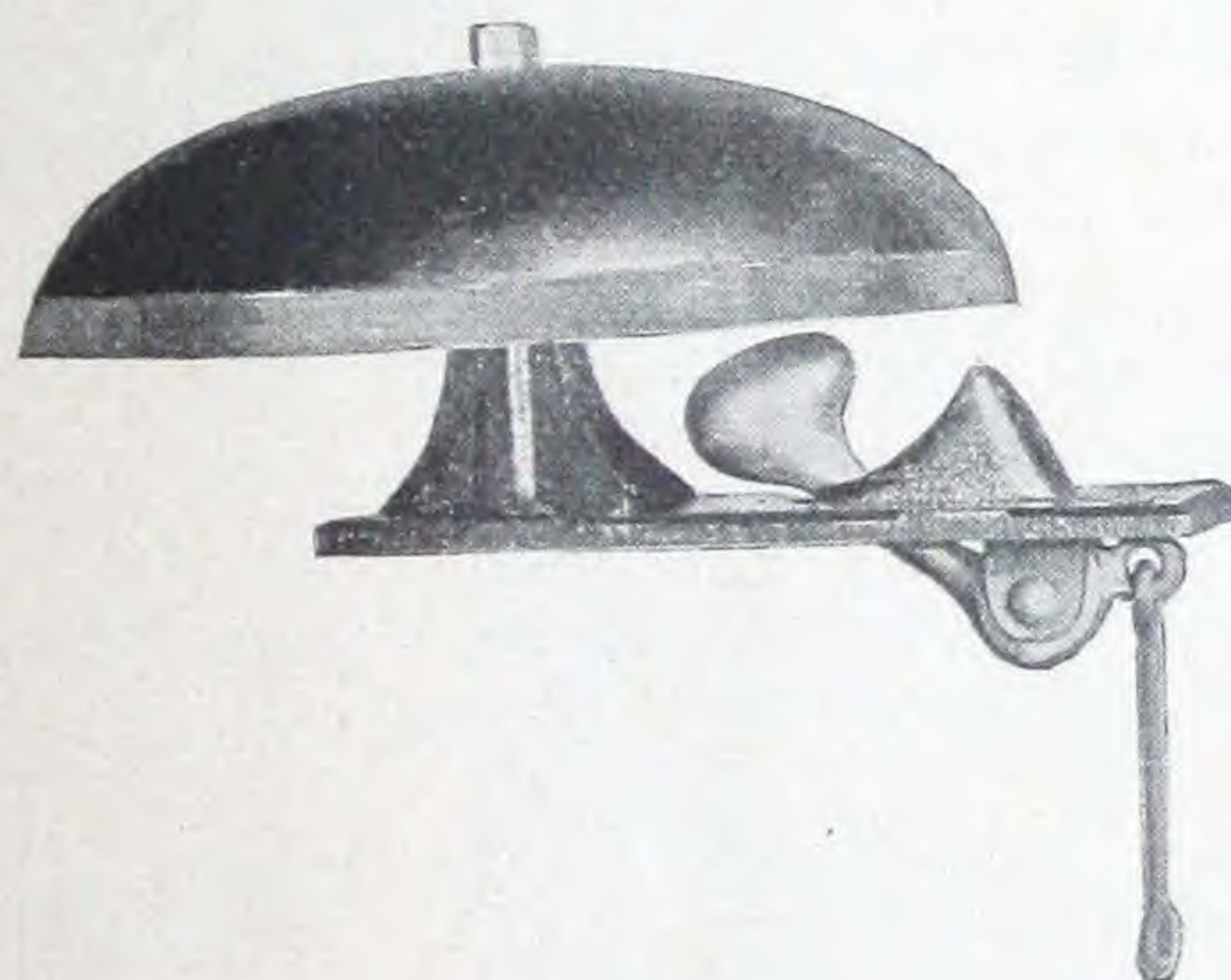


# GILT EDGE GONGS.

## ABSOLUTELY INDESTRUCTIBLE.



Trade Word.	List No.		Price.
Reposit	3889	Complete, 10 inch	\$1 40
Reprisal	3892	" 11 "	1 75



Trade Word.	List No.		Price.
Reprive	3890	Complete, 10 inch	\$1 40
Reprimand	3891	" 11 "	1 75
Reproduce	3897	Gongs only, 4 inch	15
Reproof	3898	" 5 "	20
Reprove	3899	" 6 "	30
Reproved	3900	" 7 "	40
Reprune	3901	" 8 "	60
Reptile	3902	" 9 "	1 00
Republic	3903	" 10 "	1 00
Republican	3904	" 11 "	1 25
Republish	3905	" 12 "	1 25
Repudiate	3906	" 14 "	2 00



# CRAWFORD'S PATENT AUTOMATIC PICK-UP FENDERS.

ARE THE ONLY PERFECT PICK-UP FENDERS FOR  
TRACTION CARS.

1. Their qualities are lightness, neatness, simplicity, safety, durability, cushioned, not complicated, need no attention, don't get out of order, instantly self-acting, quickly fitted to any car, quickly adjusted, quickly removed from car.
2. Our Patent Automatic Pick-Up Fender with sliding rods, can be removed from car in less than one minute by simply pulling the cotter pin on each of the two up-yielding fender rods.
3. It can be adjusted in less than one minute to carry toe normally close to the ground as desired, by screwing the nut on each of the two slide rods, or moving the cotter pin on each of the two up-yielding fender rods.
4. As to its simplicity, it can be removed from car and taken apart by pulling four cotter pins.
5. It is instantly self-acting and always ready, thus requiring no busy or confused motorman to operate it.
6. It is safe, for when striking a person it is forced instantly to rub on the ground (acting on a sensitive spring on each of the two slide rods limited by the pipes encircling same), thus preventing any person rolling in under the fender if they should happen to fall in front of it.
7. The fender resumes its normal position automatically after the object is taken off it or from in front of it.
8. The force of the blow is greatly lessened when it strikes a person, because the fender is cushioned on a sensitive spring on each of the two slide rods.
9. When attached to oscillating body of single truck cars it can be safely carried very close to the road-bed by attaching our powerful spring operated toe-plank to toe of fender.
10. Therefore it is then all the more safe and reliable when attached to oscillating car bodies.
11. It becomes still safer when it strikes a person, for the toe-plank is forced instantly to rub on the ground, where it remains until the object is taken off or from in front of it, after which it resumes its normal position automatically.
12. It will not force the car body off the truck, or be injured by plunging into and passing over any unevenness or immovable obstruction on the track (operating same as wheel guard).
13. Crawford's Patent Automatic Pick-Up Fender is self-operated by a sensitive spring, pivoted to each of the two lugs that are bolted to the car body. A screw adjustment on the lugs limits the action of the sensitive springs, after which the powerful spring operated toe-plank resists any object in front of it.
14. The Fender can be folded up if no car coupling projects in front.
15. The operations, etc., of the Pick-Up Fenders when fitted for oscillating body of single truck cars, are very similar to the wheel guard.

Trade Word.	List No.	Price.
Salvation	3907	----- each \$25 00





BECAUSE  
IT IS A  
MONEY SAVER  
AND  
BECAUSE  
IT IS A  
LIFE SAVER.  
NO STREET CAR COM-  
PANY  
CAN AFFORD  
TO BE WITHOUT IT.

WE HANDLE  
DIRECT  
FROM  
MANUFACTURERS  
AND  
SELL AT THEIR  
PRICES.  
YOUR ORDERS  
OR INQUIRIES  
WILL RECEIVE  
OUR  
PROMPT  
ATTENTION.





# PATENT AUTOMATIC WHEEL-GUARD AND PICK-UP FENDERS FOR CARS.

ARE THE ONLY LIFE AND LIMB SAVING DEVICES POSSESS-  
ING ALL THE MERITS OF PERFECTION.

1. The qualities of Crawford's Patent Automatic Wheel Guard are lightness, neatness, simplicity, safety, durability, economy, cushioned, not complicated, instantly self-acting, needs no attention, don't get out of order. Quickly removed from truck, quickly adjusted to carry toe-plank normally close to ground as desired; cannot run into wagons; immovable obstructions or unevenness in the road-bed will not injure it. Adapted to any traction car.

2. It is the only simple life and limb saving device, easily fitted to trail cars and able to stand the hard service.

3. It will prevent loose stones getting under and injuring motor shells.

4. It can be quickly fitted to truck of any car, and on the majority, if not all, by bolts or bolt holes already on truck.

5. It can be removed from truck in less than one minute by simply pulling the cotter pin on each of the two yielding-up rods.

6. It can be adjusted in less than one minute to carry toe-plank normally close to the ground as desired, by screwing the nut on each of the two slide rods, or moving the cotter pin on each of the two yielding-up rods.

7. During a heavy fall of snow the toe-plank can be raised instantly and carried six inches from the ground by swinging it upward and moving a clip on back of same to engage with the toe-spring and thereby save tampering with the proper adjustments. If carried in normal position, the weight of the snow would force it to the ground and thus clean the road-bed; but as it is not constructed for a snow plow, the toe-plank is simply swung upward temporarily.

8. It becomes still safer when it strikes a person. The toe-plank being forced instantly to rub on the ground (acting on the sensitive spring on each of the two slide rods, limited by pipes encircling same) thus preventing a person's limbs, or any movable body, getting under it or crushed under the wheels. After the object is removed the guard resumes its normal position automatically.

9. The force of the blow is greatly lessened when it strikes a person, the guard being cushioned on a sensitive spring on each of the two slide rods.

10. If by chance a person's limbs should happen to get under it (which is hardly possible, as the toe-plank is carried normally so very close to the ground, and on the ground when operating) the springs on the yielding-up rods would simply force down enough to push the body ahead and at the same time prevent it getting crushed under the wheels.

11. It will conform to any unevenness in the road-bed by a spring on each of the two yielding-up rods, thus making it impossible to force the truck off the rails or let any movable object under it, when in normal position or when forced to rub on the ground.

12. Immovable obstruction striking the guard will not injure it; it is first forced instantly to the ground (acting on the sensitive springs on slide rods limited by the pipes encircling same); then the yielding-up rods are forced upward and the powerful spring-operated toe-plank bent back under until it has passed over the obstruction. After which the guard resumes its normal position automatically. The powerful spring-operated toe-plank does not bend back in under when it strikes a movable object.

13. It relieves itself (by the two yielding-up rods) if the toe-plank comes in contact with the ground, owing to sunken rails, plunging of truck, or unevenness in the road-bed.

14. The top edge of the toe-plank is only about four inches from the road-bed when it is bent back under in passing over an immovable obstruction thus making it the more reliable. (See upper illustration on opposite page.)

15. Statistics prove that people are seldom seriously injured by the car striking them, but are crushed and killed by getting under either the rigid fenders now in use, or the wheels. It is also a fact that they are nearly always removed from under the front wheels, which proves that the car is soon stopped after striking a person.

16. Therefore, after working our Patent Automatic Wheel Guard on the different makes of cable and electric cars for some time in order to prove serviceability, etc., and after making a number of thorough tests by placing both large and small dummies and immovable obstructions on the track, we claim that this Patent Automatic Wheel Guard is the life and limb saving device long demanded by rapid transit.

Trade Word.

List No.

Salvatory

3908

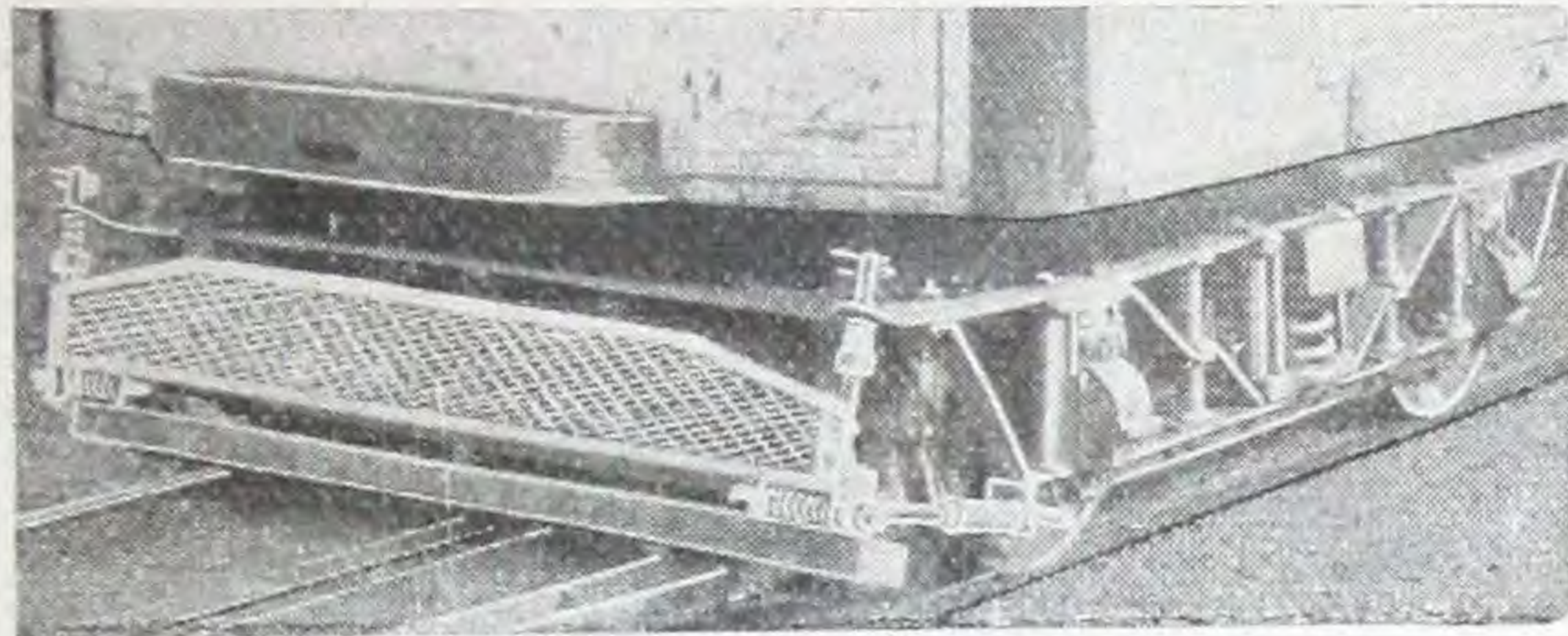
Price.

each \$20 00

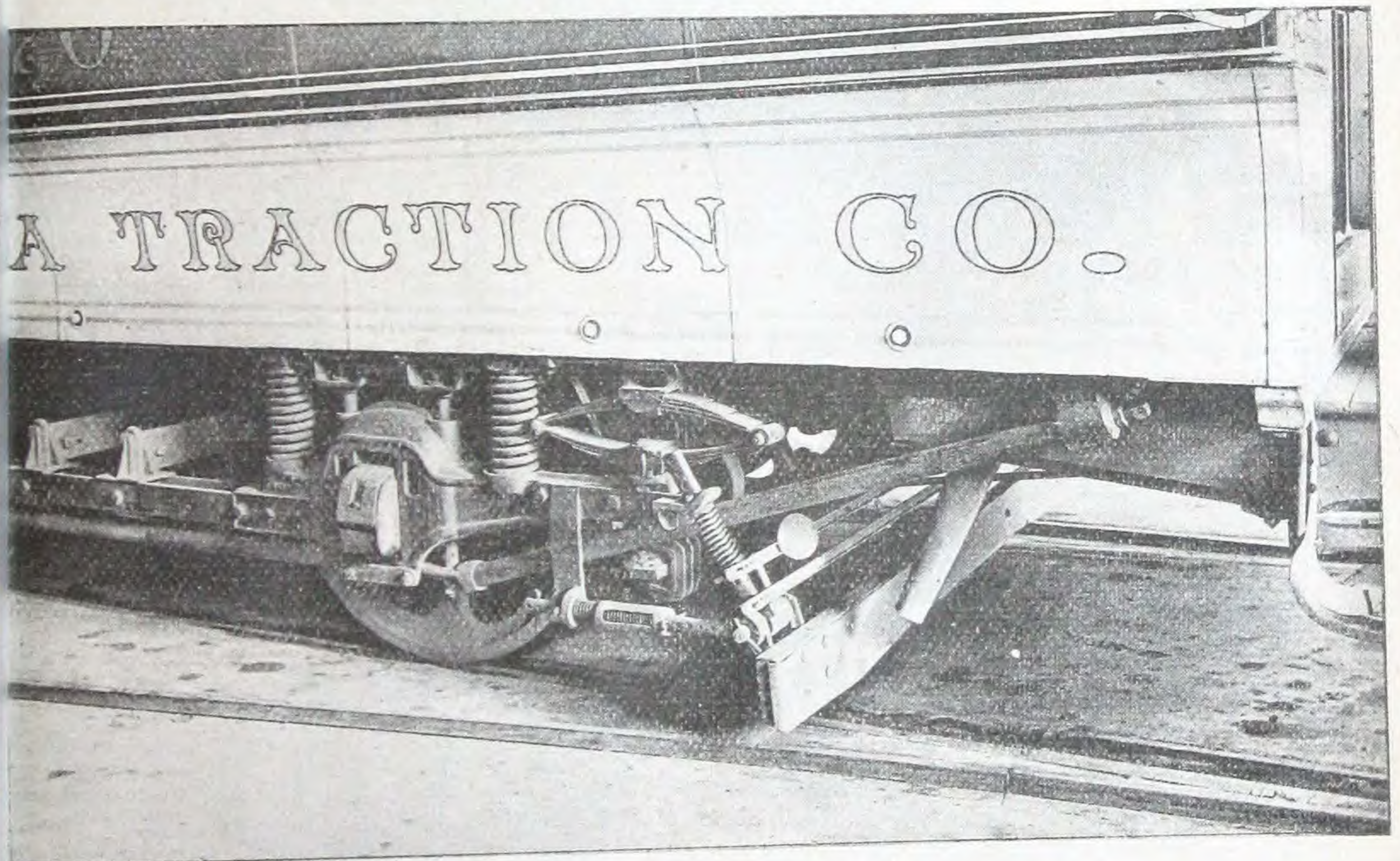


# PATENT AUTOMATIC WHEEL GUARD ON "BRILL TRUCK."

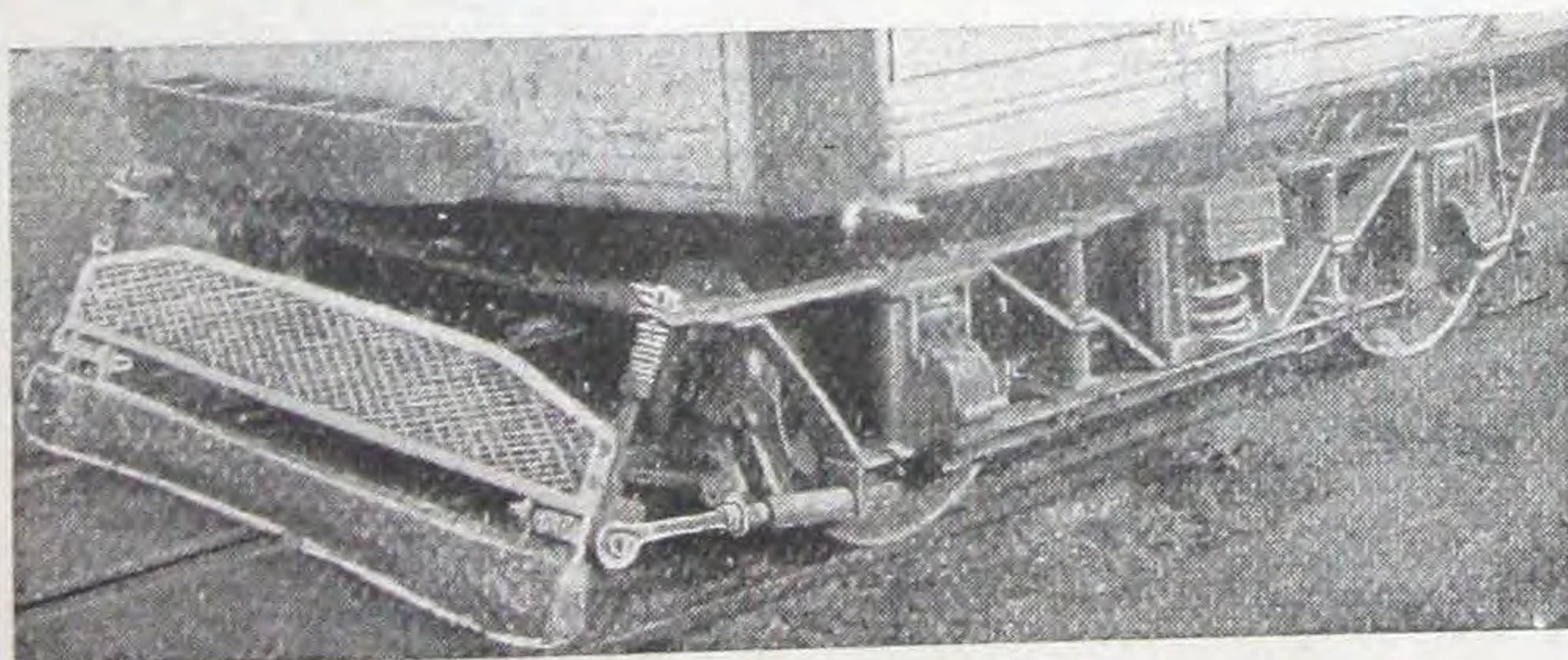
PASSING OVER IMMOVABLE OBSTRUCTION.



NORMAL POSITION.



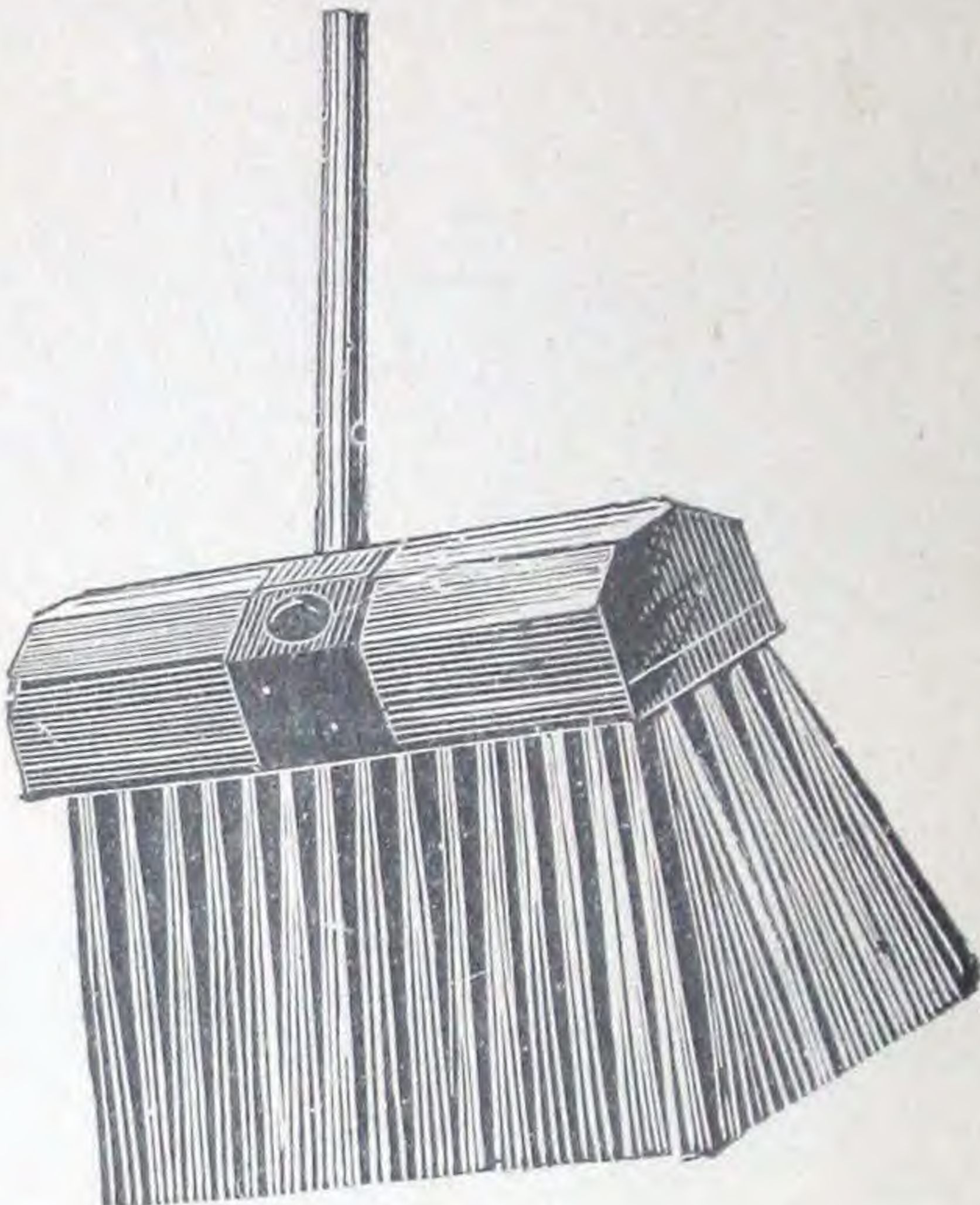
NORMAL POSITION.





STEEL WIRE SWEEPING BROOMS.  
FOR HEAVY SWEEPING.

REVERSIBLE  
HANDLE  
HOLES.

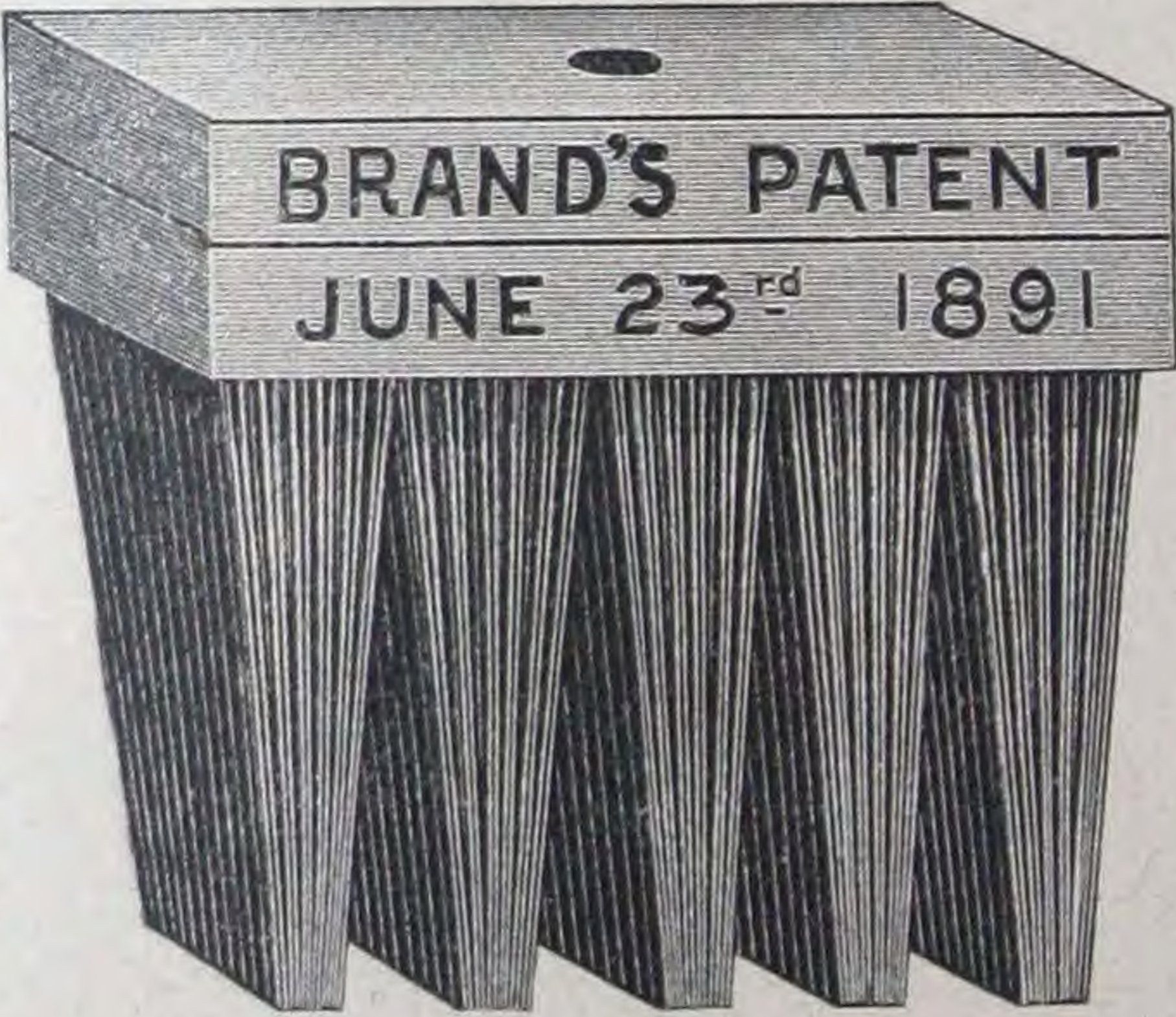


USED FROM  
EITHER.  
SIDE.

Trade Word.	List No.					Price.
Repugn	3292	8 in. brooms, 4 rows			per dozen	\$12 80
Repugnant	3293	10 " " 4 "			" "	16 00
Repulse	3294	12 " " 4 "			" "	19 20
Sabbatic	3295	14 " " 4 "			" "	22 40
Sabbatism	3296	12 " " 5 "			" "	22 40
Saber	3297	14 " " 5 "			" "	25 60
Sabian	3298	Handles			net, " "	75

STEEL TRACK BROOMS.

These steel wire track brooms are made with converging holes or perforations which bring the wires in direct contact with each other, making a solid bunch or mass of wire at the point which comes in contact with the surface of the rail. Boring the holes so that every other two rows converge to a center row makes a scraper as well as a brush, merging three rows into one row. Each wire tuft acting as a resilient reinforcing cushion to those tufts which extend from the front series of each group.

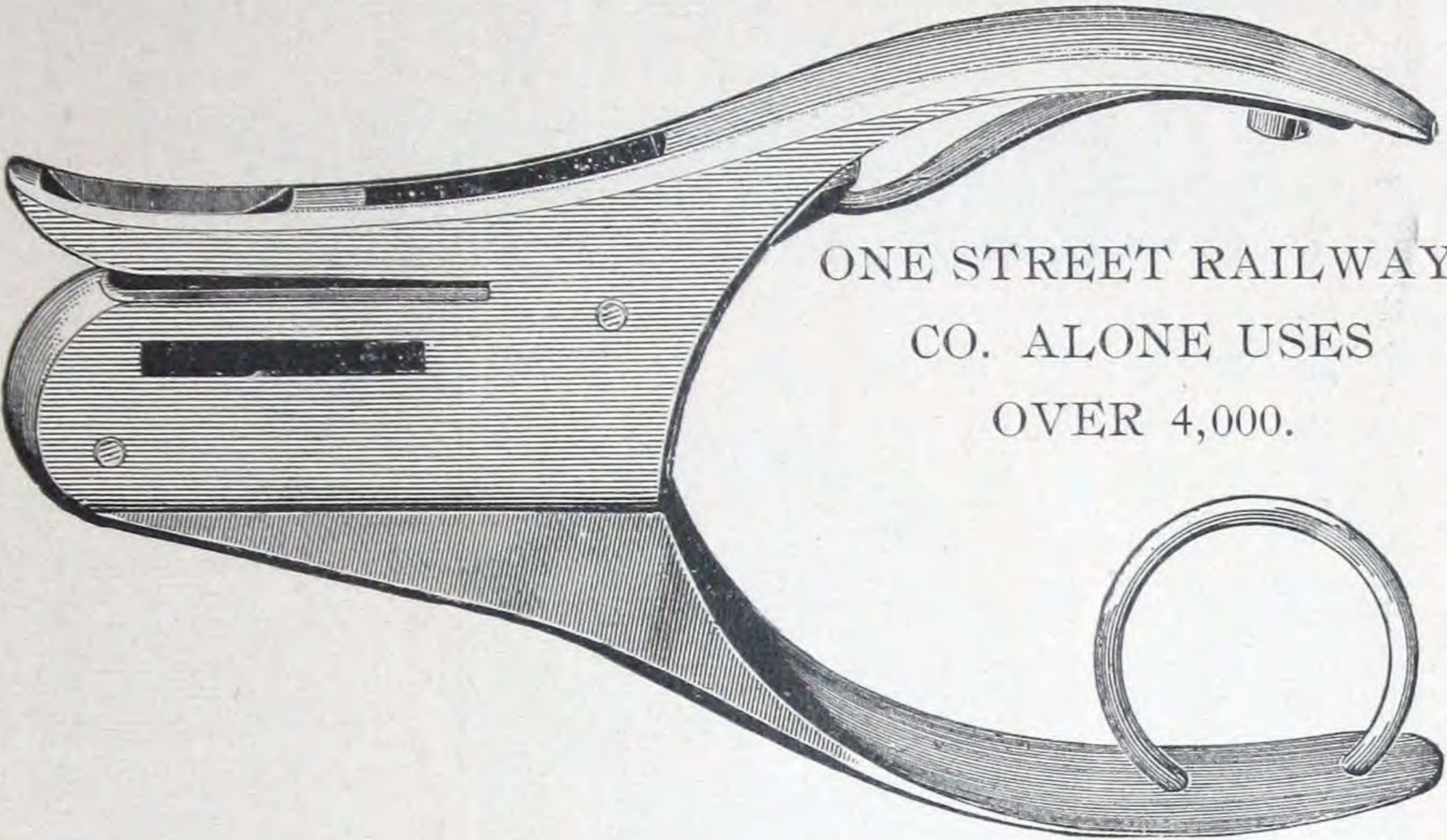


Trade Word.	List No.			Price.
Sable	3299	Medium	per dozen	\$15 00
Sabulous	3300	Heavy	" "	18 00
Saccade	3301	Extra heavy	" "	22 50



NON-CLOGGABLE AND IMPROVED TICKET  
PUNCHES.

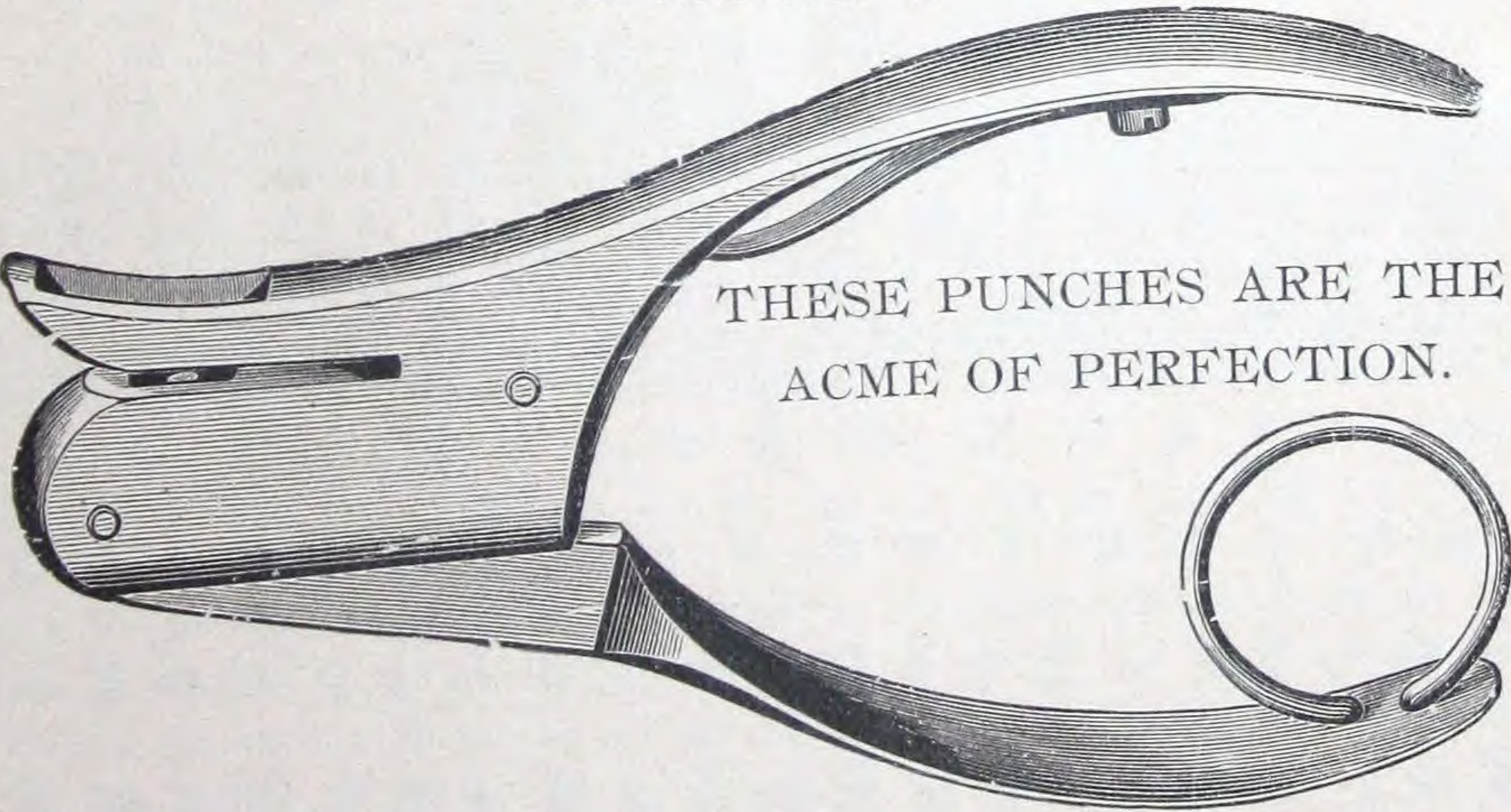
STYLE NO. 2.



ONE STREET RAILWAY  
CO. ALONE USES  
OVER 4,000.

Trade Word.	List No.			Price.
Sachem	3236	Assorted dies	per dozen	\$30 00
Sackage	3237	Round dies	" "	18 00
Sacker	3238	Square "	" "	19 00
Sacrament	3239	B punches	" "	26 00
Saraband	3240	L "	" "	28 00
Saracen	3241	L " plain	" "	24 00
Sarcasm	3242	Single punch		2 50

STYLE NO. 1.



THESE PUNCHES ARE THE  
ACME OF PERFECTION.

Trade Word.	List No.			Price.
Sacred	3243	General assortment of dies	per dozen	\$24 00
Sacrifice	3244	Round dies	" "	18 00
Sacrilege	3245	Square "	" "	19 00
Sacristan	3246	Single punch		2 50



## TICKET PUNCHES.

## LIST OF DIES FOR WOODMAN'S PATENT TICKET PUNCHES—CONTINUED.



## LIST OF DIES FOR WOODMAN'S PATENT TICKET PUNCHES—CONTINUED.





# BADGES AND CAR CHECKS.



Winker 3973.

FACE OF  
CAR CHECK.  
MADE OF  
ALUMINUM.



3976  
Winnow

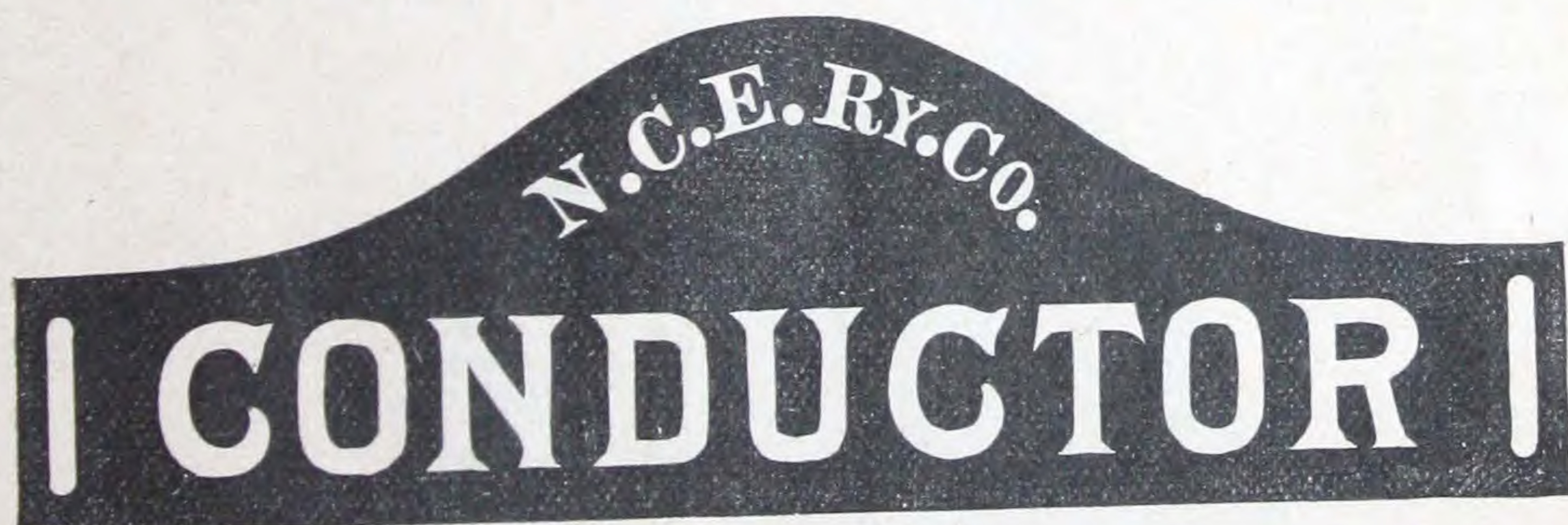


Winking 3974.

REVERSE SIDE.



3976  
Winnow



Winner 3975.

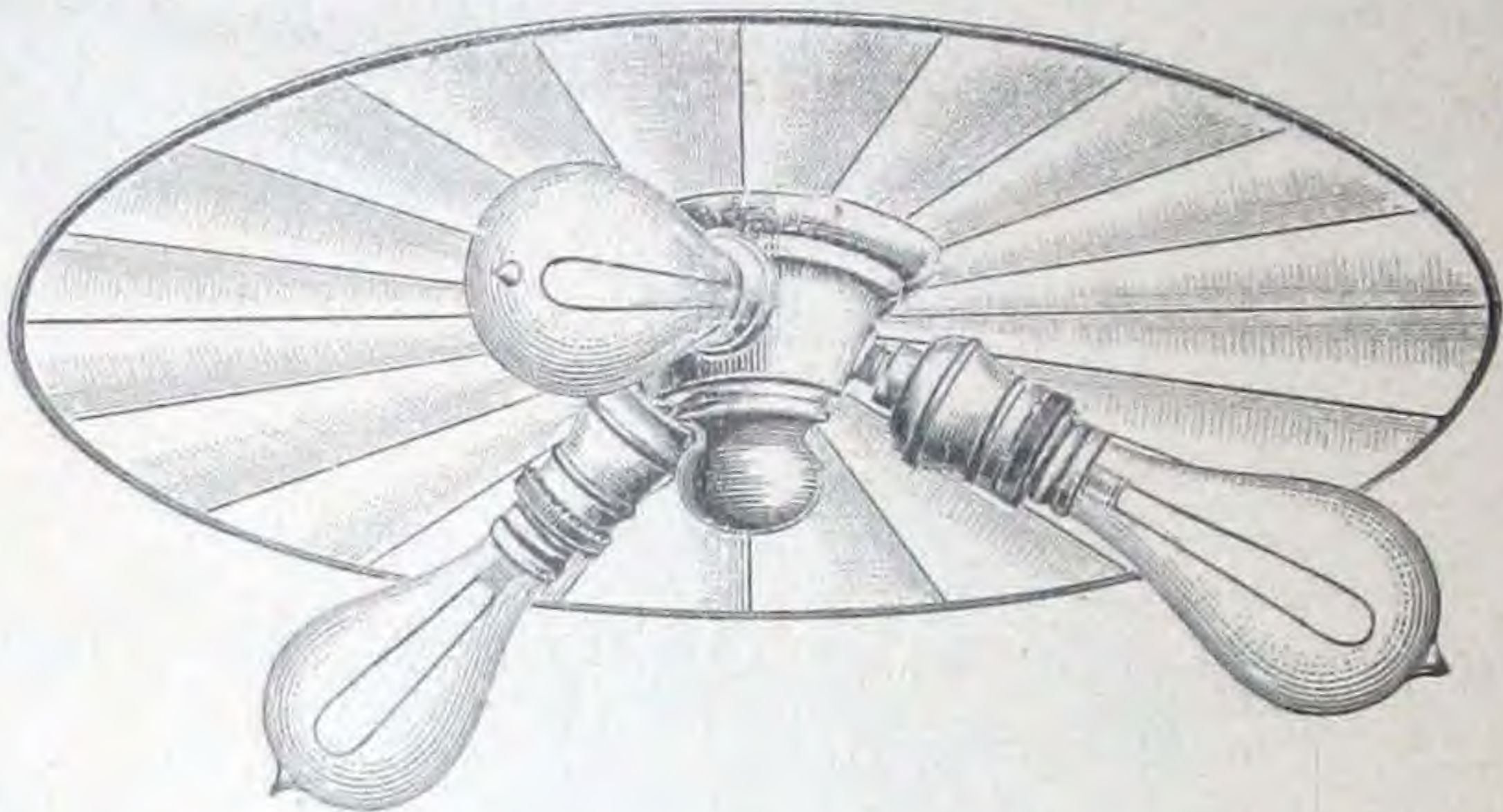
Trade Word.	List No.		Price.		Price.		Price.
Winker	3973	per doz.	\$8 00	per 100	\$50 00	per 1000	-----
Winking	3974	“ “	12 00	“ “	60 00	“ “	-----
Winner	3975	“ “	12 00	“ “	60 00	“ “	-----
Winnow	3976	“ “	-----	“ “	-----	“ “	\$36 00

German silver, nickle plated, all styles and sizes furnished with any lettering desired.



STREET CAR FIXTURES.

SILVER PLATED MIRROR REFLECTORS.



Trade Word.	List No.					Price.
Salve	3909	Three-light fixture only	-----	each		\$4 50
Salver	3910	Fixture and reflector, 10 in.	-----	"		6 30
Salvo	3911	" " " 12 "	-----	"		6 50
Sambo	3912	" " " 14 "	-----	"		7 00
Sanable	3913	" " " 16 "	-----	"		7 80
Sanation	3914	Three-light electroliers, 18 in.	-----	"		8 70

THREE-LIGHT ELECTROLIERS.



Trade Word.	List No.					Price.
Sanative	3915	10 in. long fixture only	-----	each		\$9 00



## ELECTRIC HEADLIGHT.

FOR  
DASHBOARD  
USE.

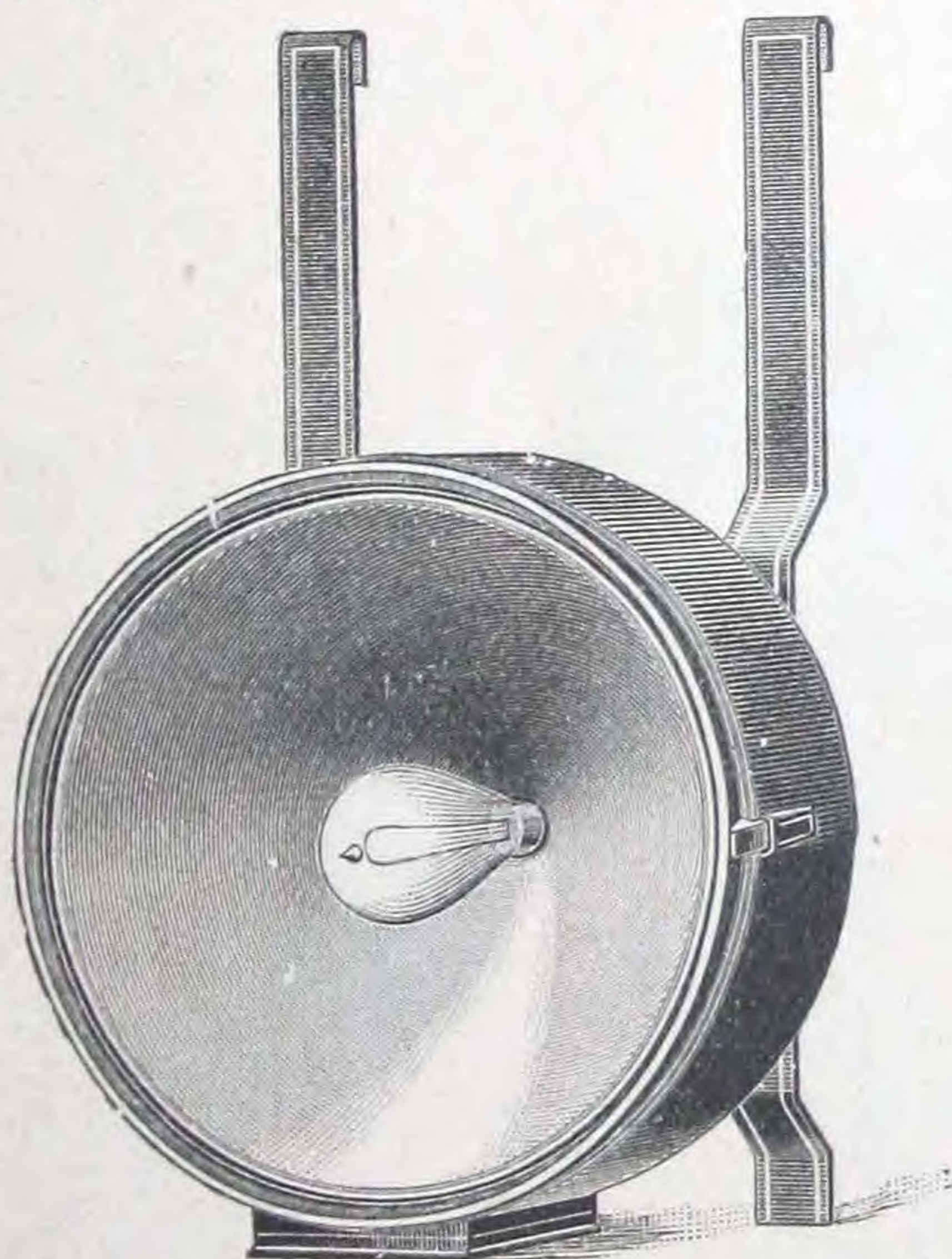


DETACHABLE  
WITH  
REVERSIBLE  
SIGNS.

With our patent revolving signs, showing only the immediate destination of car. As easily transferable to the other end of car as an oil headlight would be. Has nickel plated parabolic reflector of full size, bringing out lettering of signs upon ground glass with the utmost clearness, while the roadway ahead is brilliantly lighted through the eight inch circle of clear glass in the center. Durable, efficient, and a great success every way.

Trade Word.	List No.		Price.
Sanctify	3916	Without receptacle boxes, lamp or lettering-----each	\$28 00
Sanction	3917	Receptacle boxes for dashboards -----"	4 00

DETACHABLE.



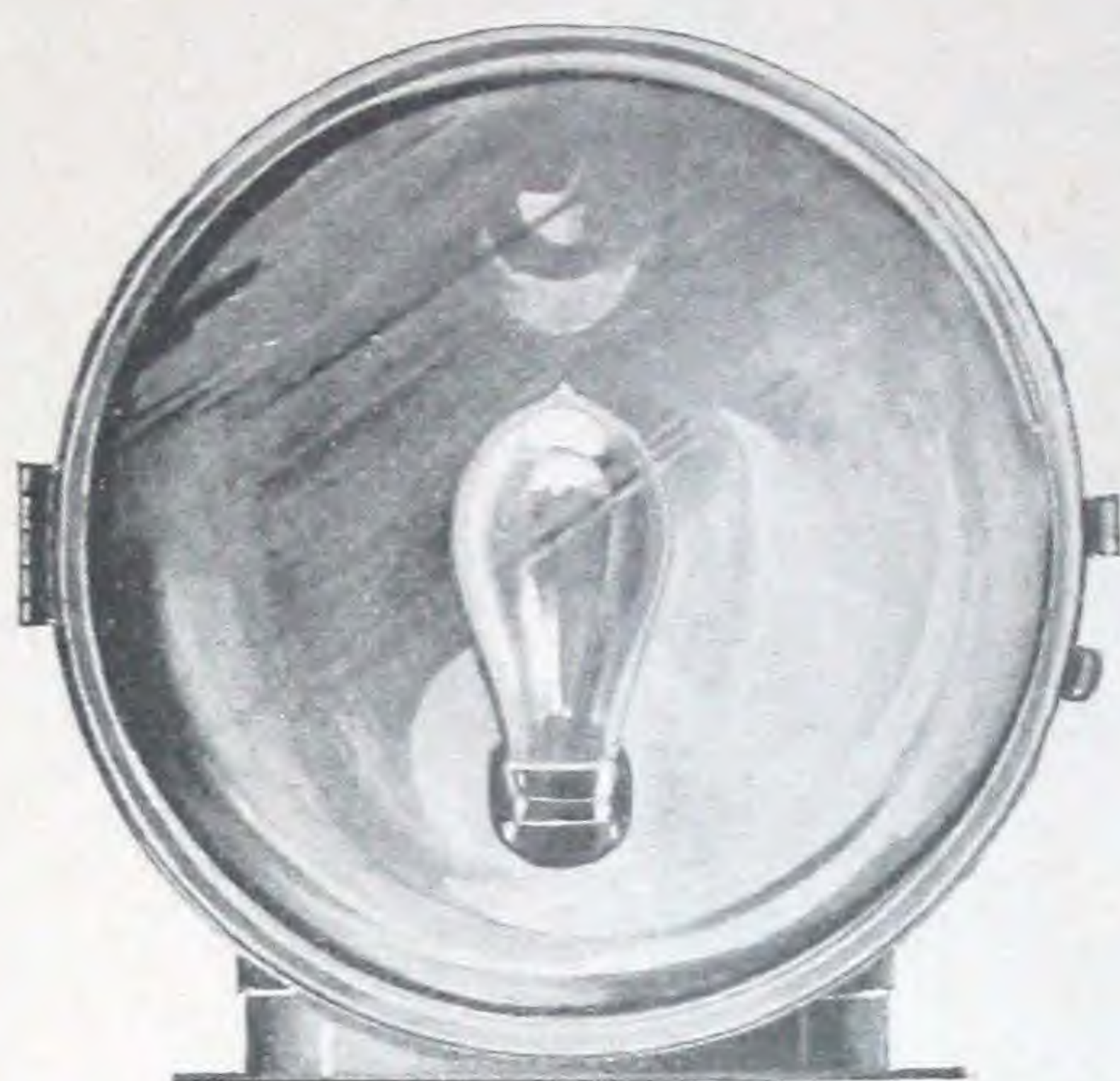
FOR  
DASHBOARD  
USE.

As convenient for transfer from one end of the car to the other as an oil headlight would be. Putting headlight into place on dashboard makes electrical connection. Only one headlight necessary for each car.

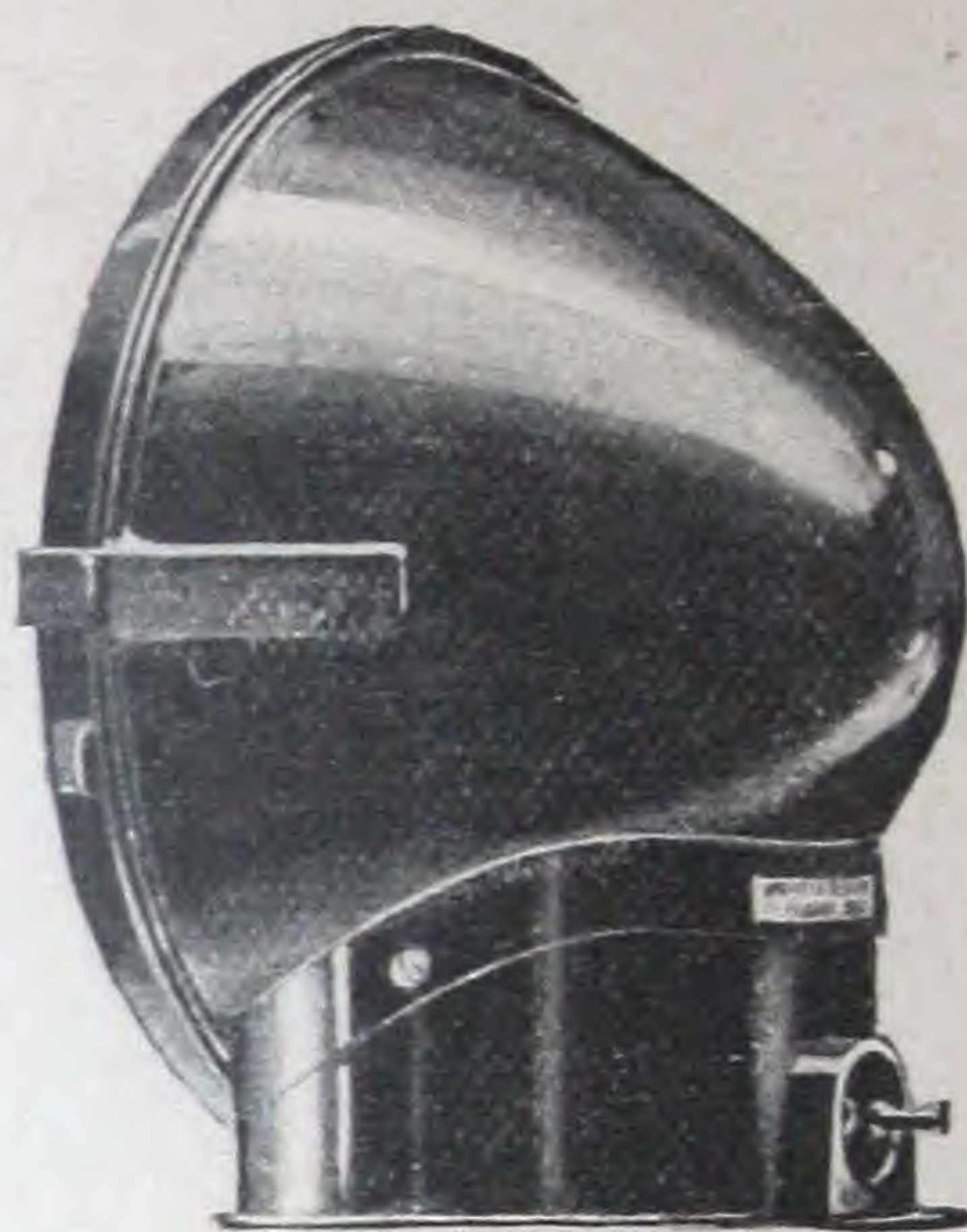
Trade Word.	List No.		Price.
Sanctum	3918	Without receptacle boxes or lamp-----each	\$22 00
Sanctitude	3919	Receptacle boxes for attachment to dashboard - "	4 00



## ELECTRIC HEADLIGHT.

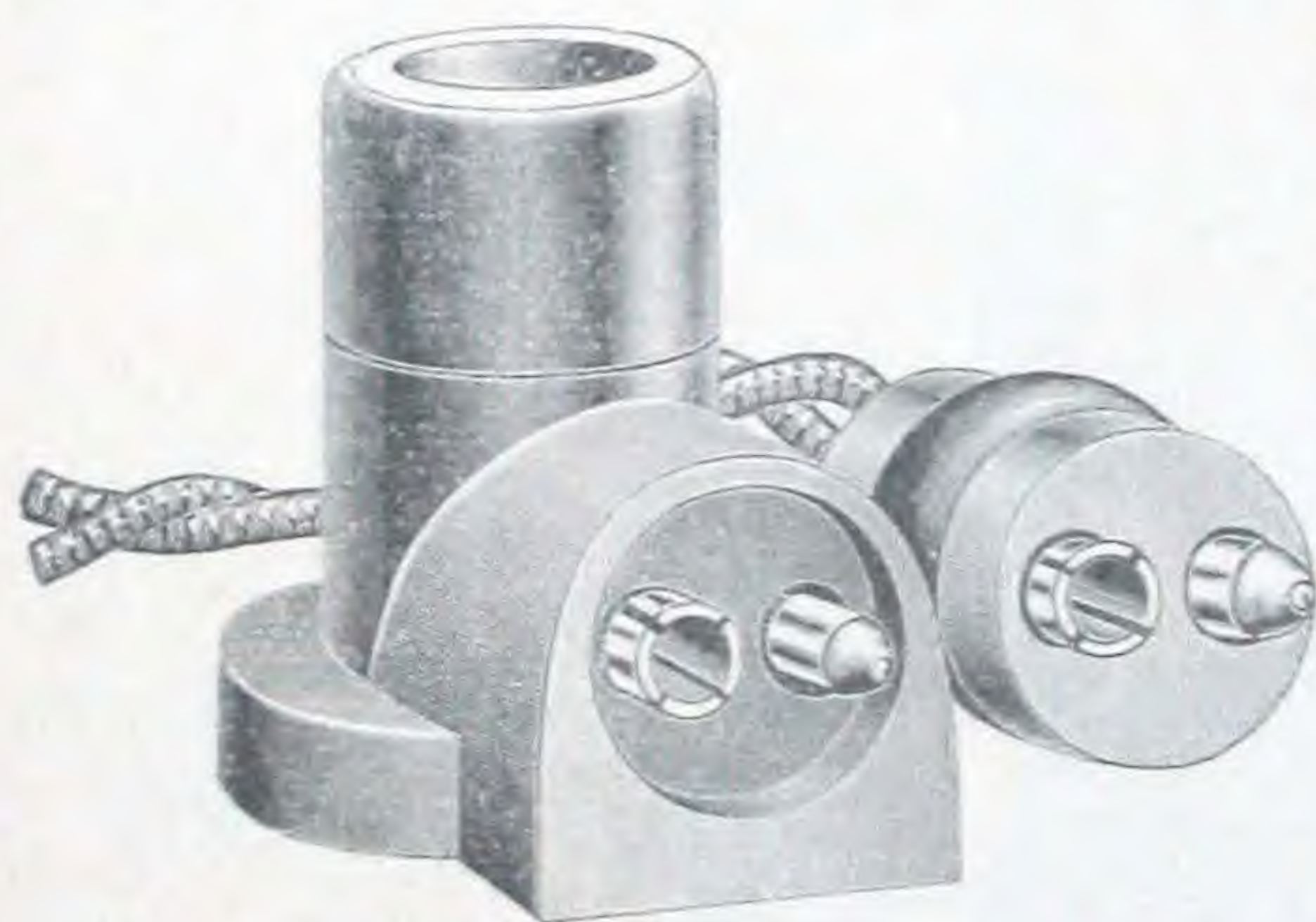


Front View.

Side View.  
Showing Rubber Socket Connections.

Reflector of true parabolic form giving light of maximum power. Has an outer shell or case to protect reflector from injury, is exceedingly neat in appearance, substantial and water-proof.

Trade Word.	List No.	Price.
Scamper	3956	Complete, except lamp ..... each \$20 00



Made of hard rubber, thoroughly water-proof, readily detachable and perfect in operation.

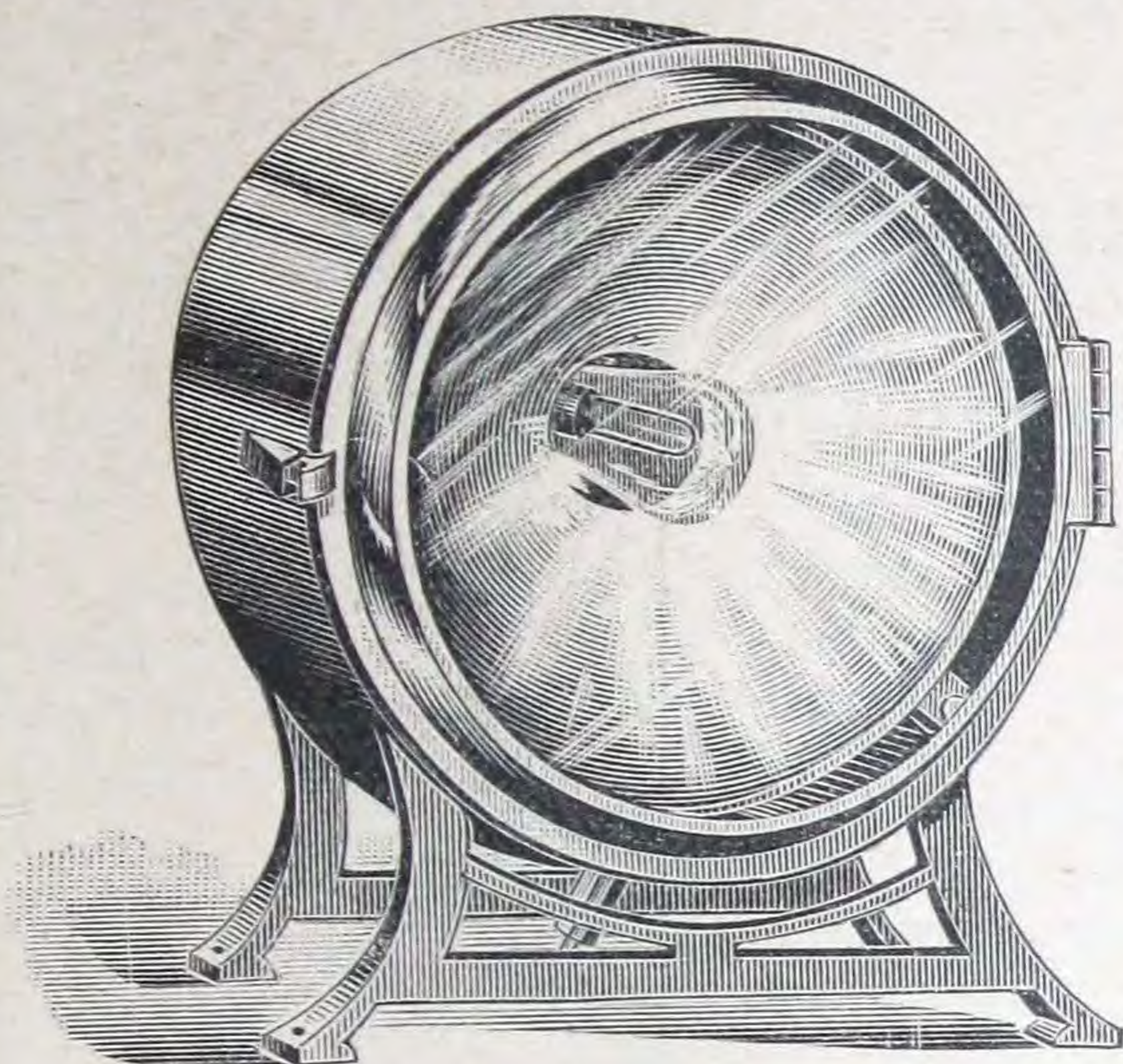
Trade Word.	List No.	Price.
Scatter	3957	Edison system ..... each \$4 00
Scattering	3958	Thomson-Houston ..... " 4 00



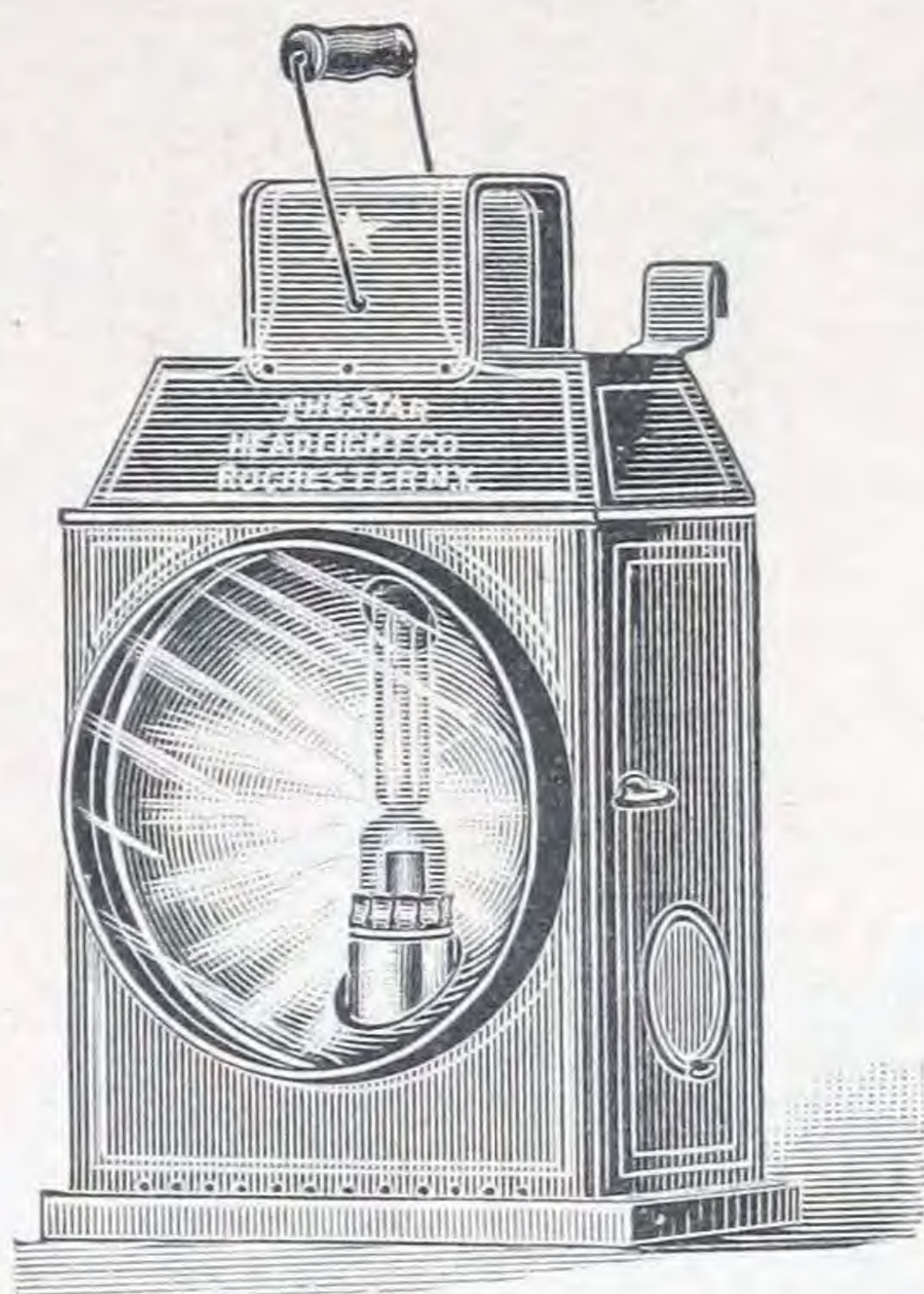


# HEADLIGHTS.

10-INCH ELECTRIC HEADLIGHT.



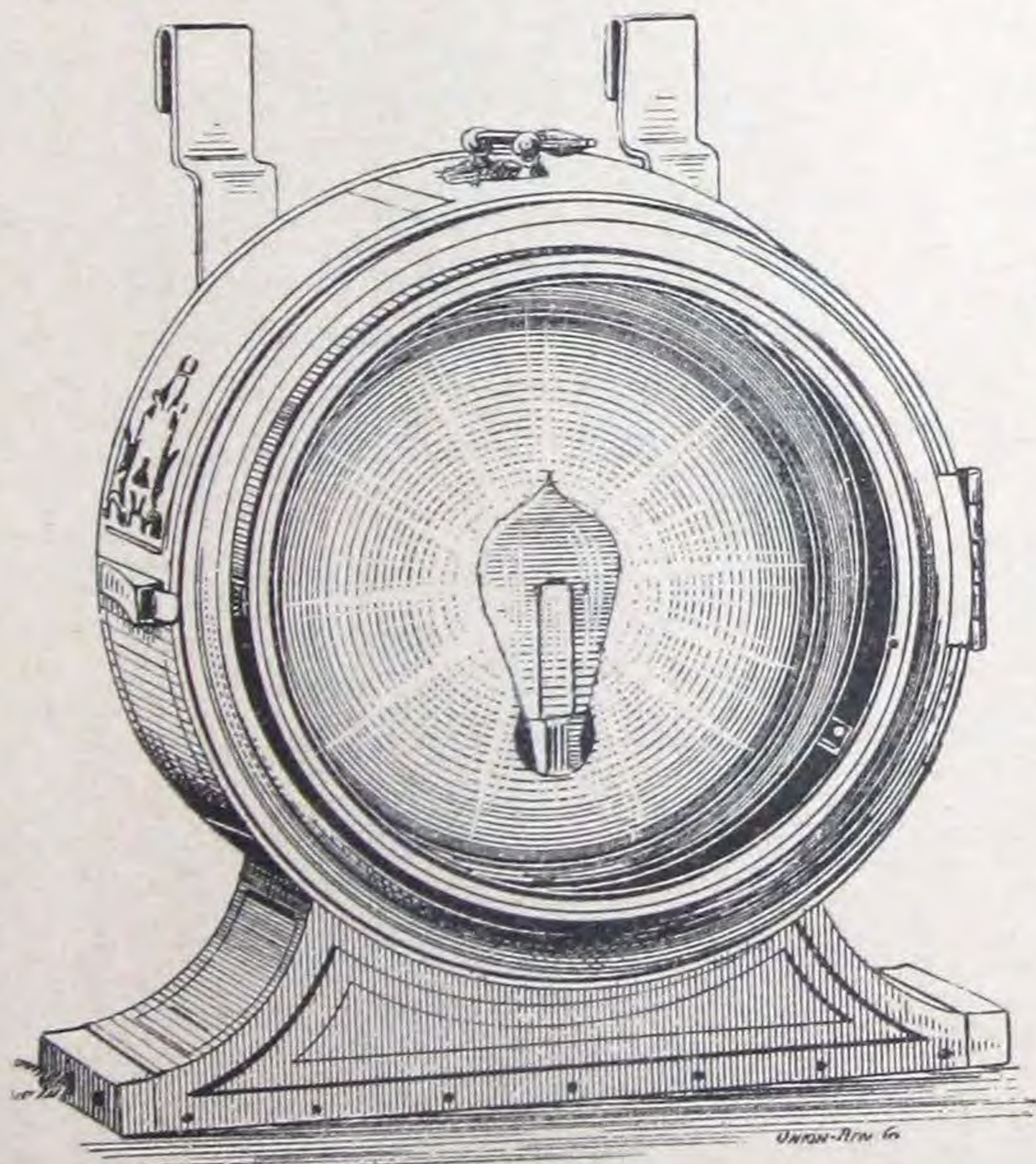
10-INCH SQUARE HEADLIGHT.



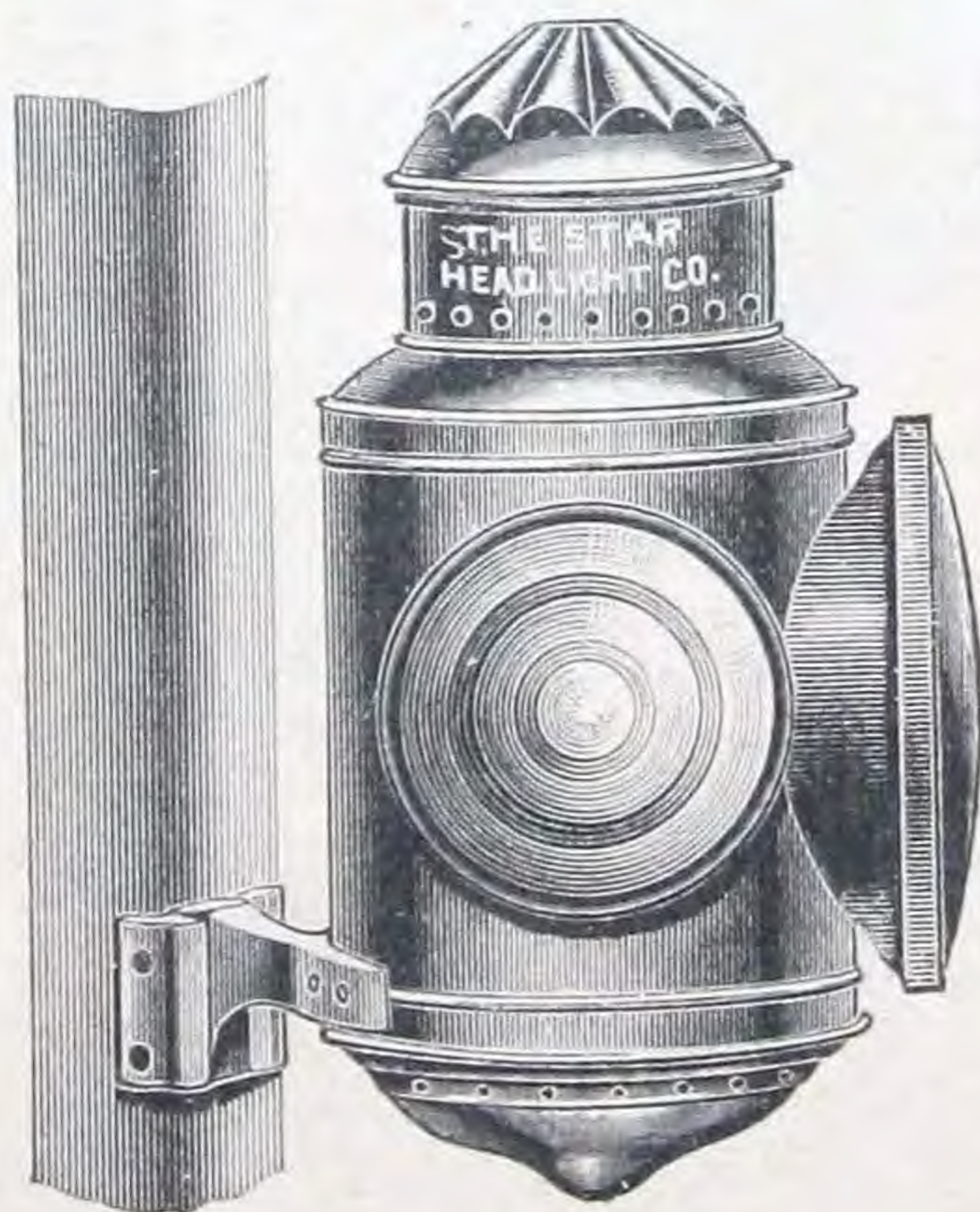
Height 20 inches.

Trade Word.	List No.	Price.	Trade Word.	List No.	Price.
Sacristy	3920	each \$17 00	Sadden	3921	each \$14 00

10-INCH ELECTRIC HEADLIGHT.



NEW REAR AND FRONT SIGNAL.



For street cars to designate route.

Trade Word.	List No.	Price.	Trade Word.	List No.	Price.
Saddle	3922	each \$17 00	Saffron	3923	each \$6 00



## THE KESTER ARC LAMP.

### ARC LAMPS FOR ALL SYSTEMS.

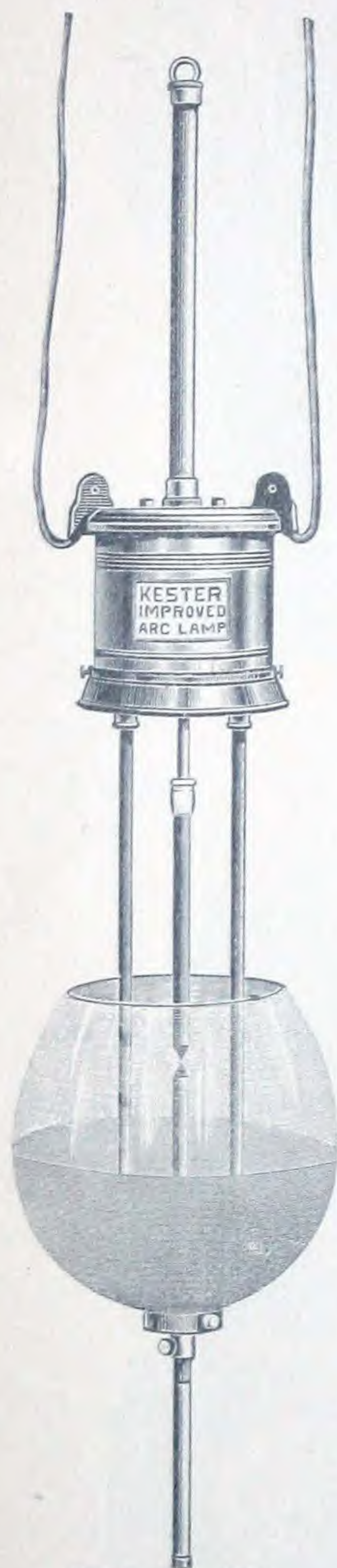
Direct incandescent, street railway, alternating and constant current. These lamps are perfect in every detail. Every part is made of the best material. No tin or cheap iron is used in any part of same, thus making them perfectly adapted for outdoor as well as indoor use.

The shell enclosing the mechanism of the lamp can be removed or lowered simply by turning the two thumb screws. It is not necessary to remove these lamps from the line or take them down in order to get at the interior. Any part of the feeding mechanism can be replaced or removed without removing the lamps from the circuit. Every part is interchangeable. The entire make-up of the lamp is so extremely simple that any person can get a clear idea of the entire working parts at a glance. There is no clock escapement used; no verge to rust; does not require oiling every few weeks, no adjustable weights, no soldered connections, no friction wheels to corrode and stop feeding of the lamp, no ribbon or chain feed.

We guarantee them to give perfect satisfaction and to outlast any other arc lamp. It is not necessary to switch these lamps out of circuit when the carbons are consumed as that is done automatically, thus making our lamp perfectly suited for all purposes and without any waste of current when the lamp is not burning.

These lamps have been worked up to such a state of perfection that no attention whatever is required to keep them in order.

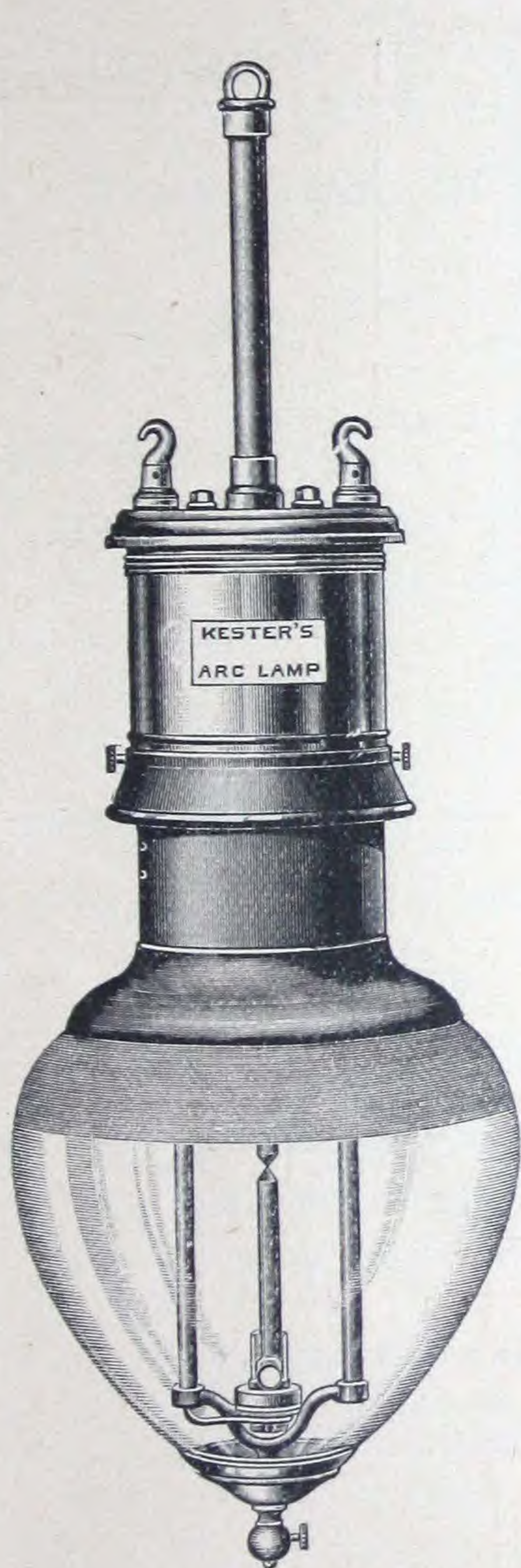
Style 3223 for constant current and street railway circuits.



Style No. 3223.



THE KESTER ARC LAMP—Continued.



3224



3225



## THE KESTER ARC LAMP—Continued.

## DIRECT INCANDESCENT LAMPS.

Trade Word.	List No.		Price.
Directed	3222	-----each	\$31 00
Director	3224	-----"	33 00
Directing	3225	-----"	40 00

In ordering please give voltage of machine.

## STREET RAILWAY LAMPS.

Trade Word.	List No.		Price.
Streek	3223	-----each	\$31 00
Street	3224	-----"	33 00
Streetview	3225	-----"	40 00
Streetward	3226	Rheostat-----"	30 00

## CONSTANT CURRENT LAMPS.

Will burn on any series arc circuit.

Trade Word.	List No.		Price.
Constancy	3223	-----each	\$40 00
Constantly	3224	-----"	42 00
Constant	3225	-----"	50 00

In ordering please state amperage of machine.

## ALTERNATING CURRENT LAMPS.

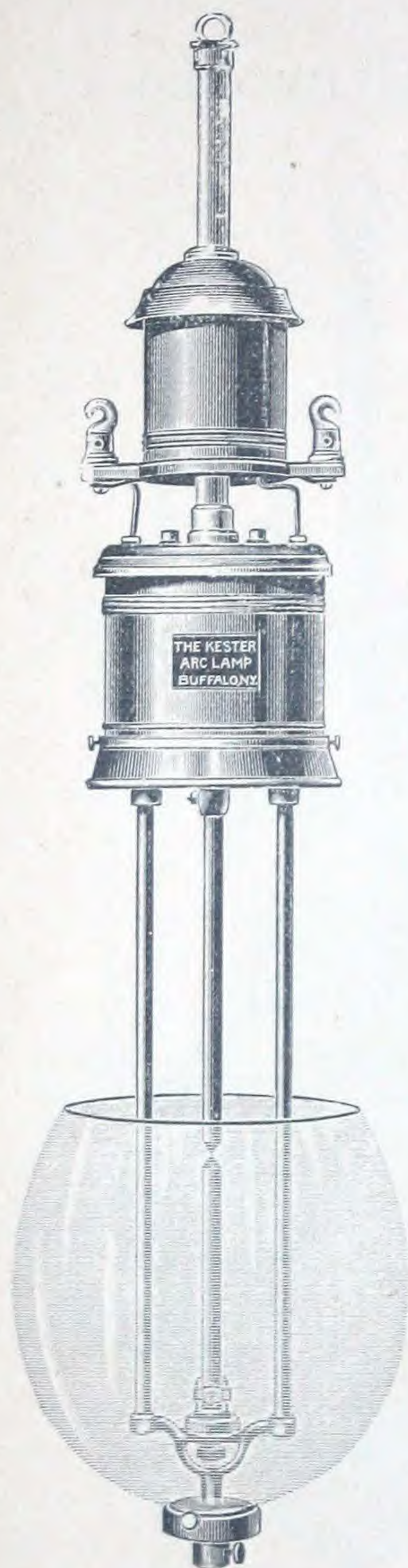
Trade Word.	List No.		Price.
Altered	3224	-----each	\$35 00
Altering	3225	-----"	44 00

## ECONOMY COILS FOR REDUCING THE VOLTAGE FROM 50 AND 100 VOLTS TO 30 VOLTS.

Trade Word.	List No.		Price.
Sagacious	3227	50 V coil to furnish current for one or two lamps-----	\$16 00
Sagacity	3228	100 V coil to furnish current for one, two or three lamps	20 00

## REMARKS:

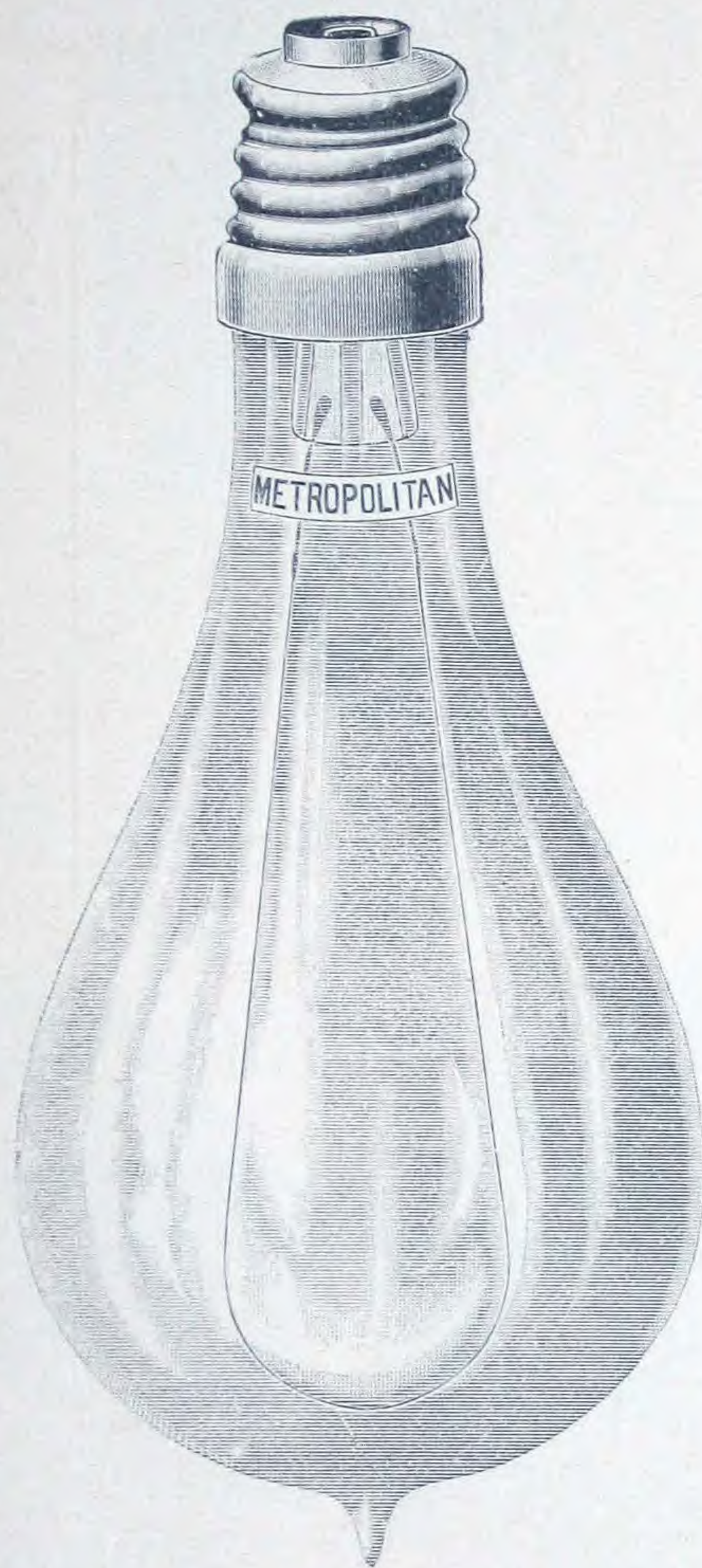
In ordering lamps, please state whether for indoor or outdoor use; also number of hours you wish them to burn without recarboning. Lamps are constructed to burn any number of hours from seven to fourteen. We will ship any amount of lamps on an order from you, and if not as represented, they can be returned to us at our expense.



3222



# METROPOLITAN RAILWAY INCANDESCENT LAMP.



ECONOMICAL  
IN  
CONSUMPTION  
OF  
CURRENT.

LONG LIVED  
STRONG  
FILAMENT  
BRILLIANT  
LIGHT.

Trade  
Word.  
Sainted

List  
No.  
3924

Tied filament for street railway work

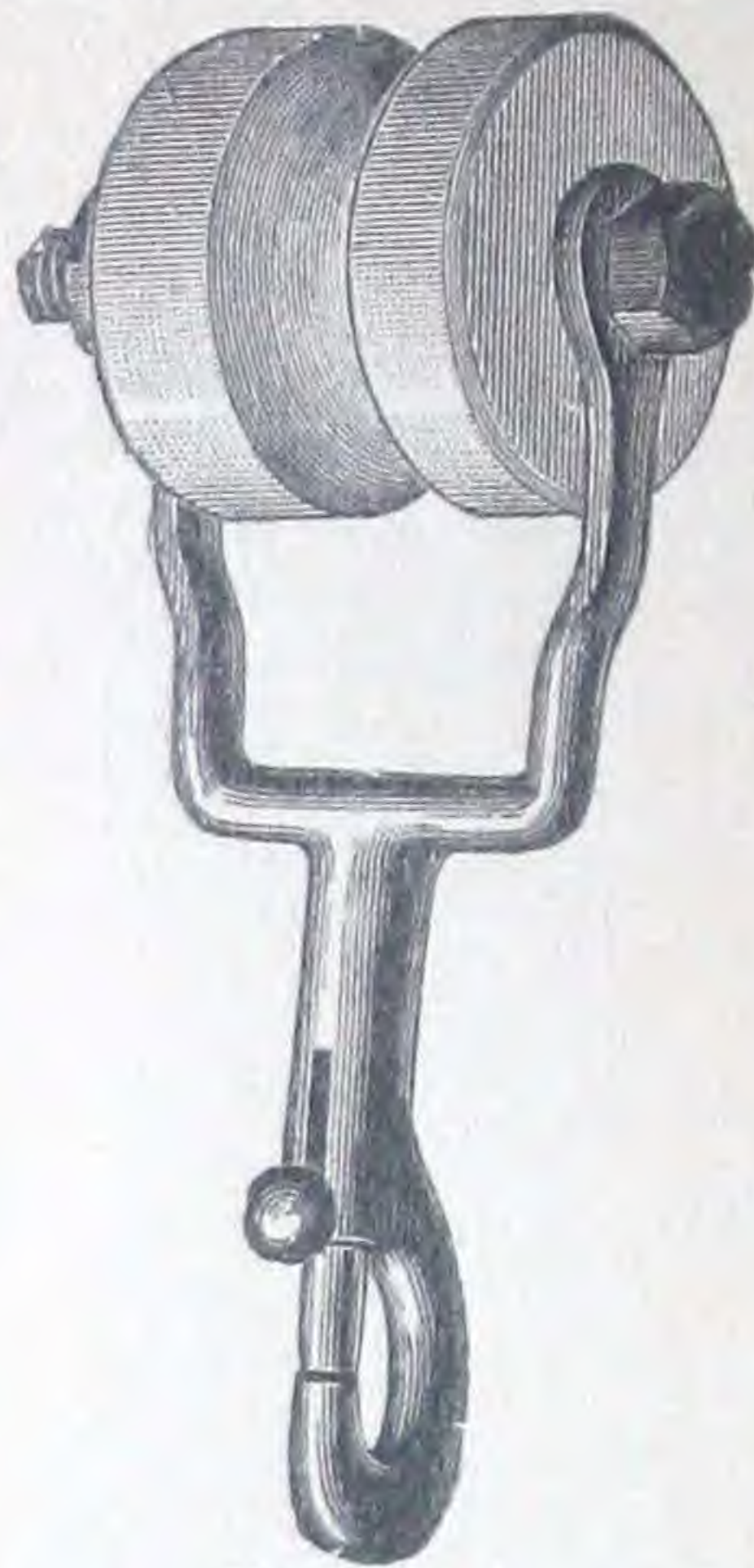
Price.  
Special

“MAC” TAPE WILL STICK TIGHT AND

IT WON'T DRY UP EITHER.



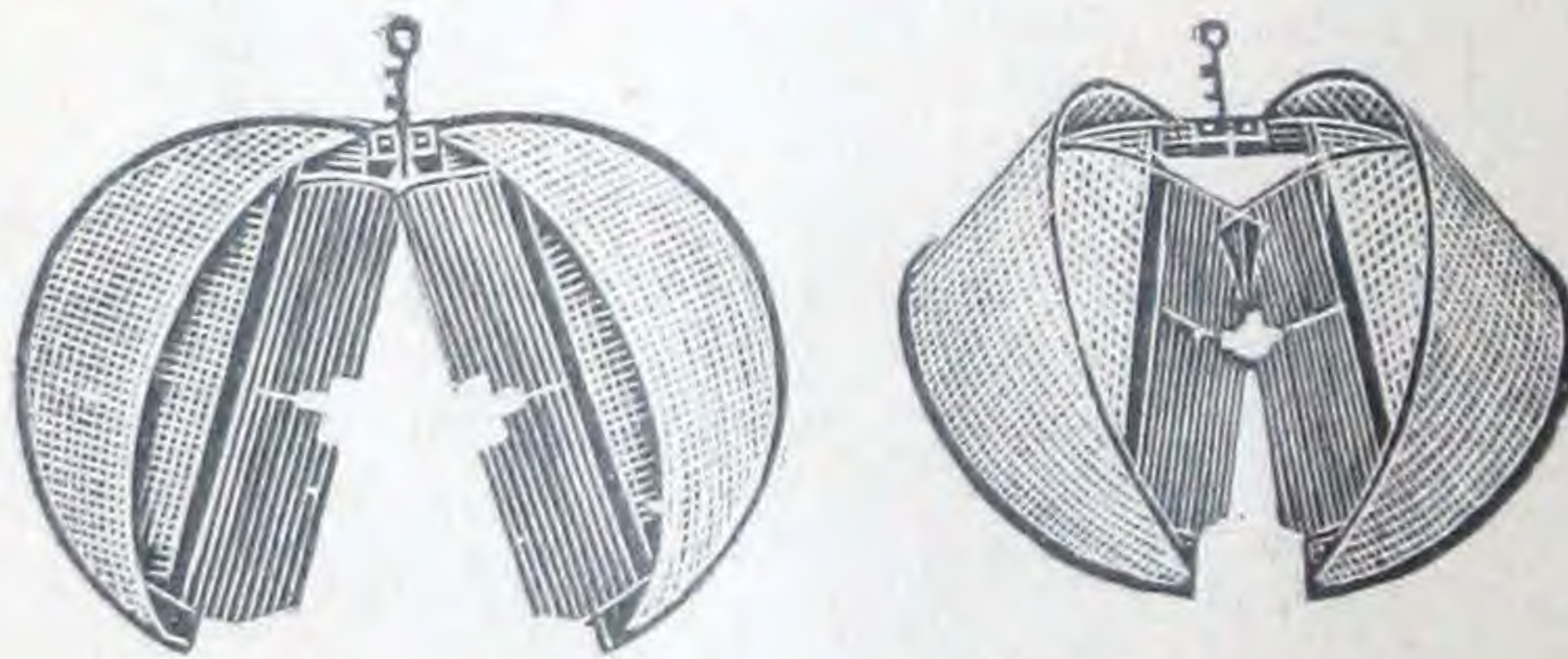
## FLETCHERS' INSULATING ARC LAMP HANGER.



Patented.

Trade Word.	List No.		Price.
Salad	1095	-----each	\$0 50

## CHICAGO ARC LIGHT SPARK ARRESTER.



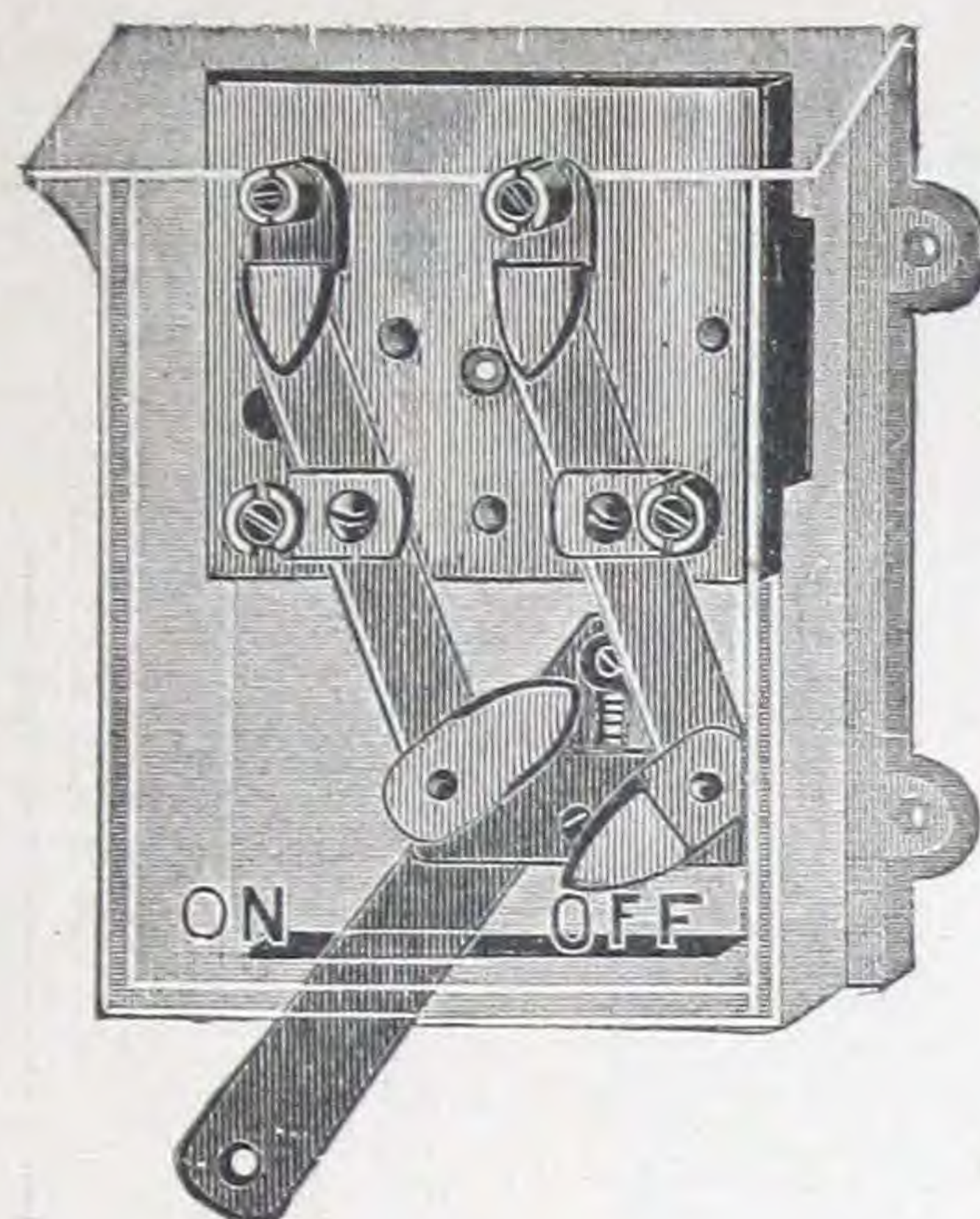
The Chicago spark arrester is made to fit any system, either single or double carbon lamps, and is fastened by an adjustable clamp to the lamp holder, inside or outside, and is arranged to open out, separating in the center so that once in position it is permanently fastened, and is easily opened to each side whenever necessary to trim carbons or change the globe.

The cover is arranged to automatically open and close as the carbon holder passes downward through the two mica plats. It is shown in both positions in the accompanying illustration. These plates are hinged and balanced, and close immediately after the holder has passed through. While held at an angle during the time that the holder is gradually being lowered by the consumption of the carbons, the device is so constructed that a draught is established, which draws the sparks away from the carbons, and the upper arrangement or hood of the arrester is so placed that the sparks cannot escape. Those who have examined the Chicago spark arrester predict its very general use.

Trade Word.	List No.		Price.
Salam	3331	-----each	\$2 00

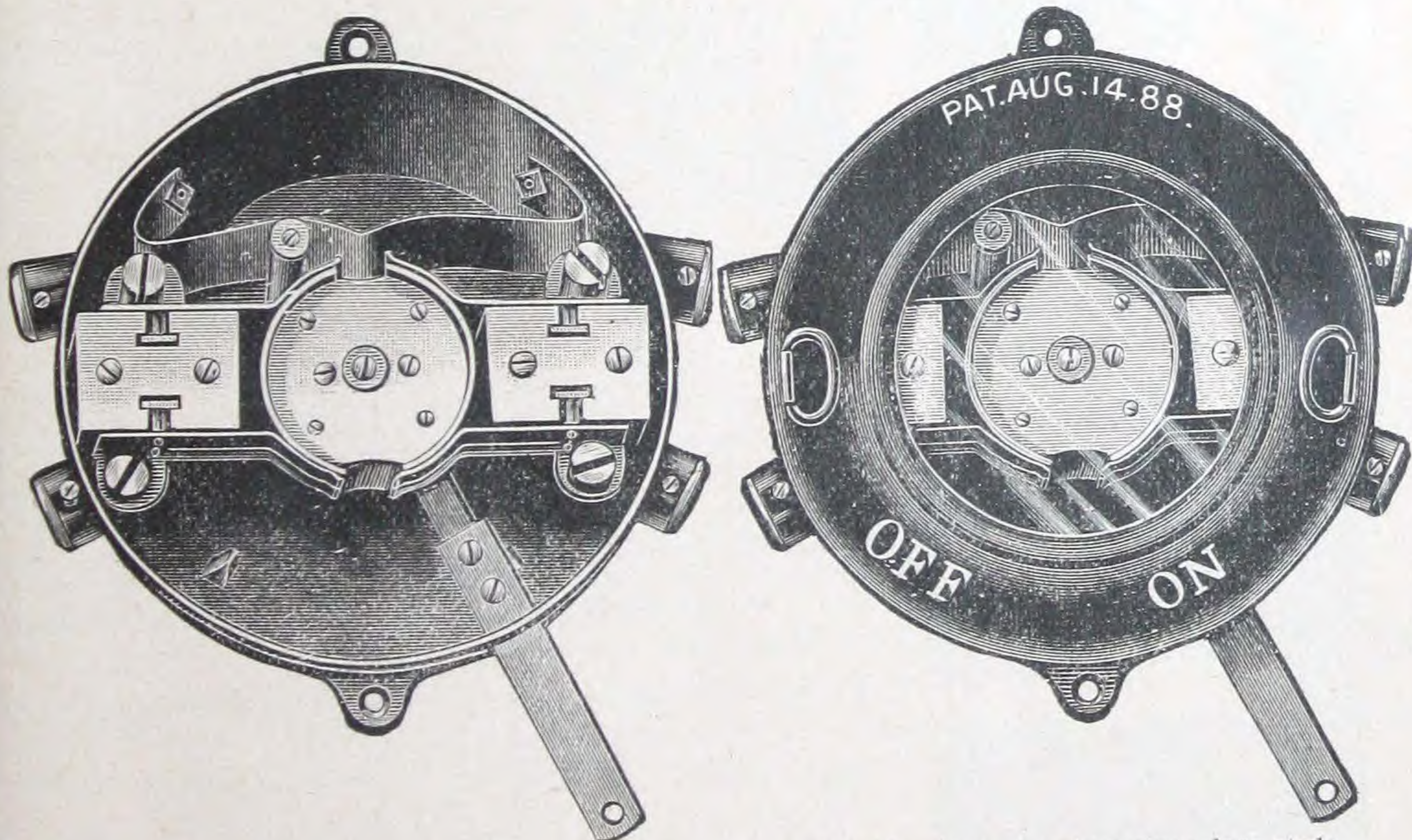


## CLEVELAND ARC CUTOUT.



Trade Word.	List No.	Price.
Tabular	1135	each \$3 50

## POWERS' ARC LIGHT CUTOUTS.



Inside view.

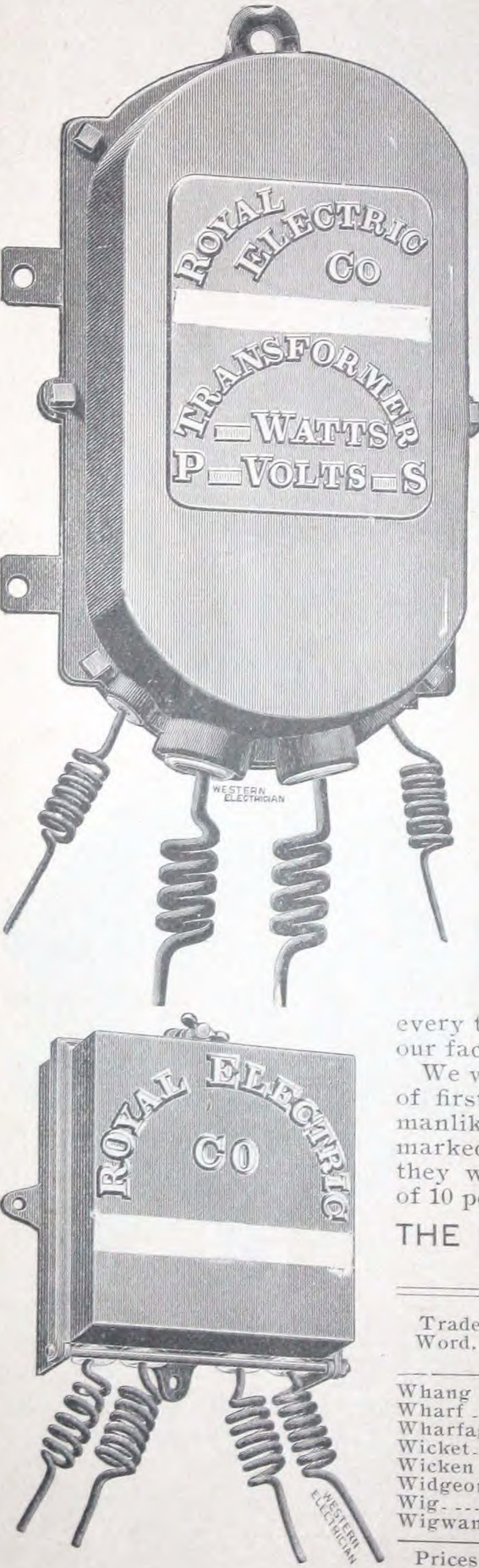
Outside view, showing glass face style.

Made with either glass or metal face and weatherproof case with insulated wire holes. The insulation is entirely of porcelain. Will carry forty amperes.

Trade Word.	List No.	Price.
Tabulate	1134	each \$4 00



# ROYAL TRANSFORMERS.



Being the exclusive agents for the above transformer we are enabled to ship promptly upon receipt of order, and will guarantee entire satisfaction to our customers in every instance.

Our transformers have been very extensively used for the past four years, with entire satisfaction to all the purchasers. They have stood the most severe tests, under all the variable conditions which they were subjected to, both by the consumers as well as ourselves. We can, therefore, with safety make the statement that they are the most efficient, economical and durable transformers now on the market.

The different parts which make up this transformer have been designed so as to reduce heating to a minimum, to make the regulation perfect, and the insulation the very best. The efficiency is the highest obtainable. Great care is taken in selecting good material only, and a rigid inspection is maintained during the entire process of manufacture. They are neat in appearance, easy to place in position, and can be operated on all systems now in general use.

The secondary or lamp circuit can be so connected that either 50 or 100 volt lamps can be used. They are provided with a separate and most approved fuse box, so constructed that they can be re-fused with ease and safety, while the current is on the main line.

We cheerfully invite every purchaser to carefully examine and test every transformer purchased, and any one proving defective or unsatisfactory will be replaced with a perfect one. Each and every transformer is tested under actual load at our factory, before we send the same out.

We warrant every transformer to be well made of first-class material, and in a good and workmanlike manner; to have an output equal to the marked rated capacity, and further guarantee that they will, with safety, withstand an overloading of 10 per cent.

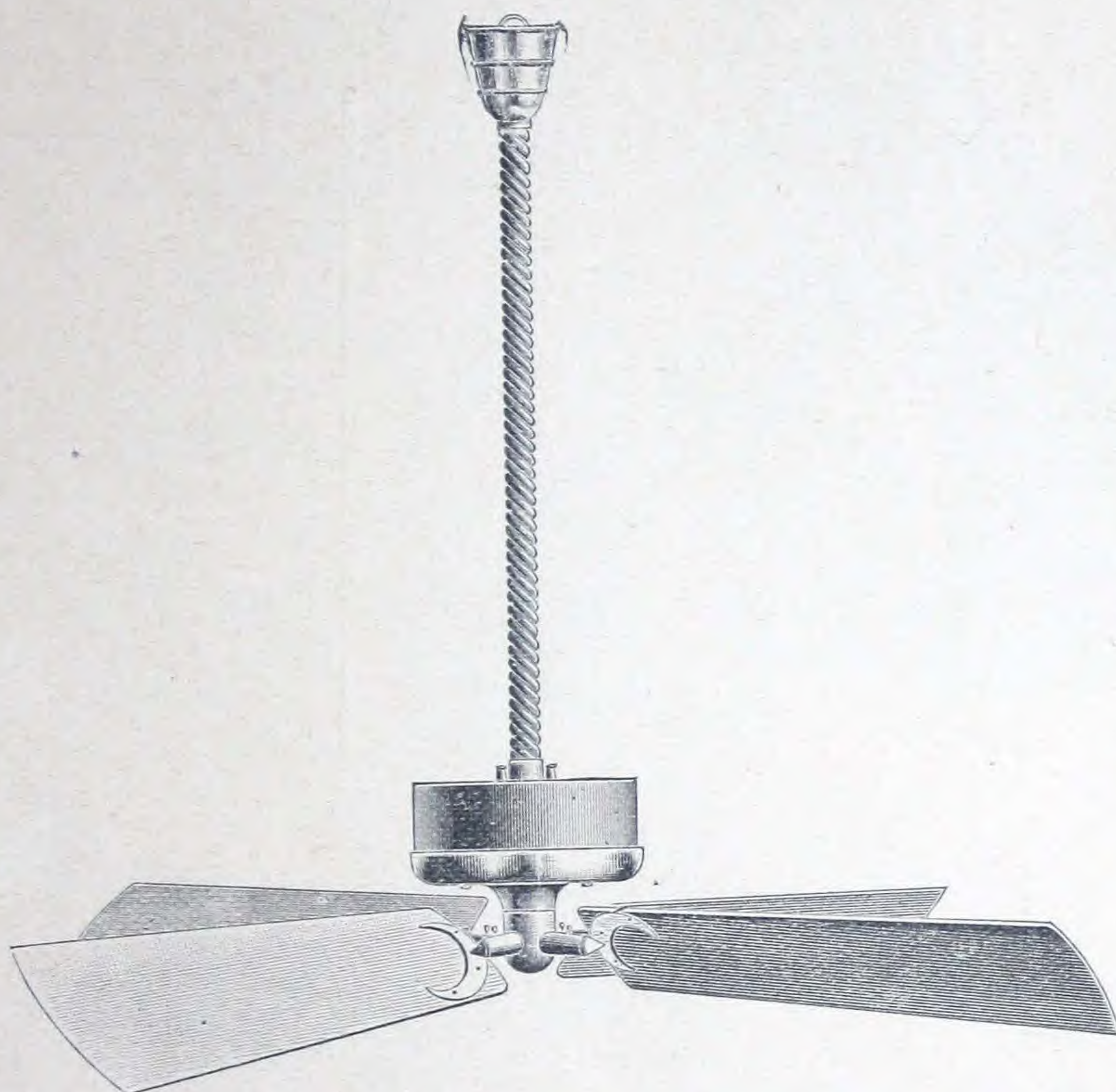
## THE FOLLOWING SIZES CARRIED IN STOCK.

Trade Word.	List No.	No. of Lights, 16 C. P.	No. of Watts.	Weight in Lbs. Without Boxing.	List Price.
Whang ---	3977	5	250	25	\$20 00
Wharf ----	3978	10	500	64	32 00
Wharfage	3979	20	1000	103	55 00
Wicket----	3980	30	1500	128	75 00
Wicken ---	3981	40	2000	182	90 00
Widgeon..	3982	60	3000	270	120 00
Wig- -----	3983	80	4000	390	152 00
Wigwam..	3984	100	5000	480	180 00

Prices on larger sizes furnished on application.



## DAYTON ELECTRIC CEILING FAN.

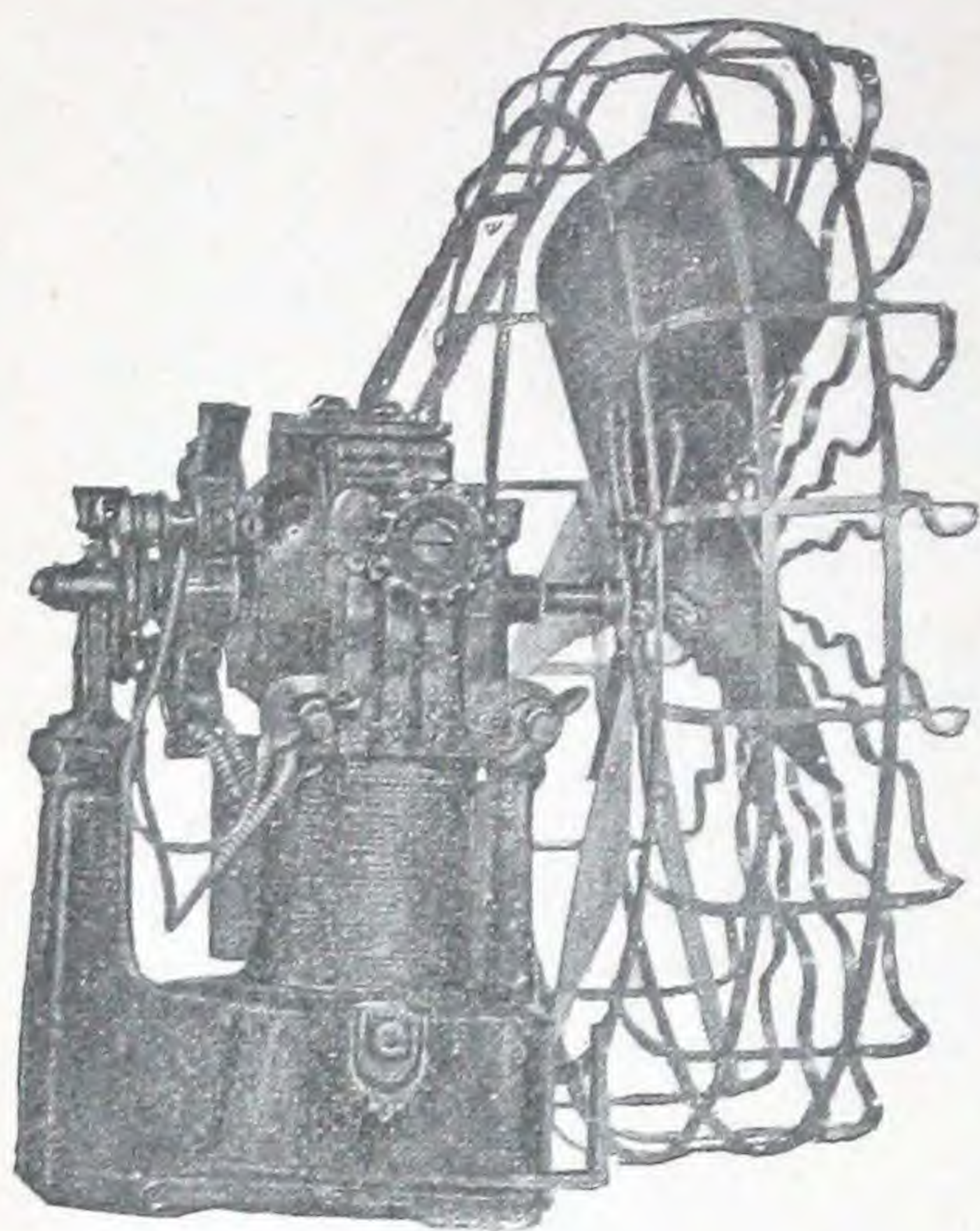


A good idea of the appearance this fan presents may be gained by reference to the accompanying illustration. It is ornamental in design, absolutely noiseless, mechanically and electrically correct in operation, sub-lubricating, economical in the use of current and positively cannot drip oil. It requires no more space than the ordinary chandelier and is propelled by a small motor just above the fan blades and suspended by a hook securely fastened to the joists in the ceiling. During the winter months it can very easily be taken down and stored, leaving the room perfectly free from defacement. The motors are wound for 110 volts, 220 volts and 250 volts, direct current to be operated in series on a 500 volt street railway circuit or any number of amperes of continuous arc circuit.

Trade Word.	List No.	Price.
Salebrous	3231	each \$50 00



## CROCKER-WHEELER DESK AND BRACKET FANS.



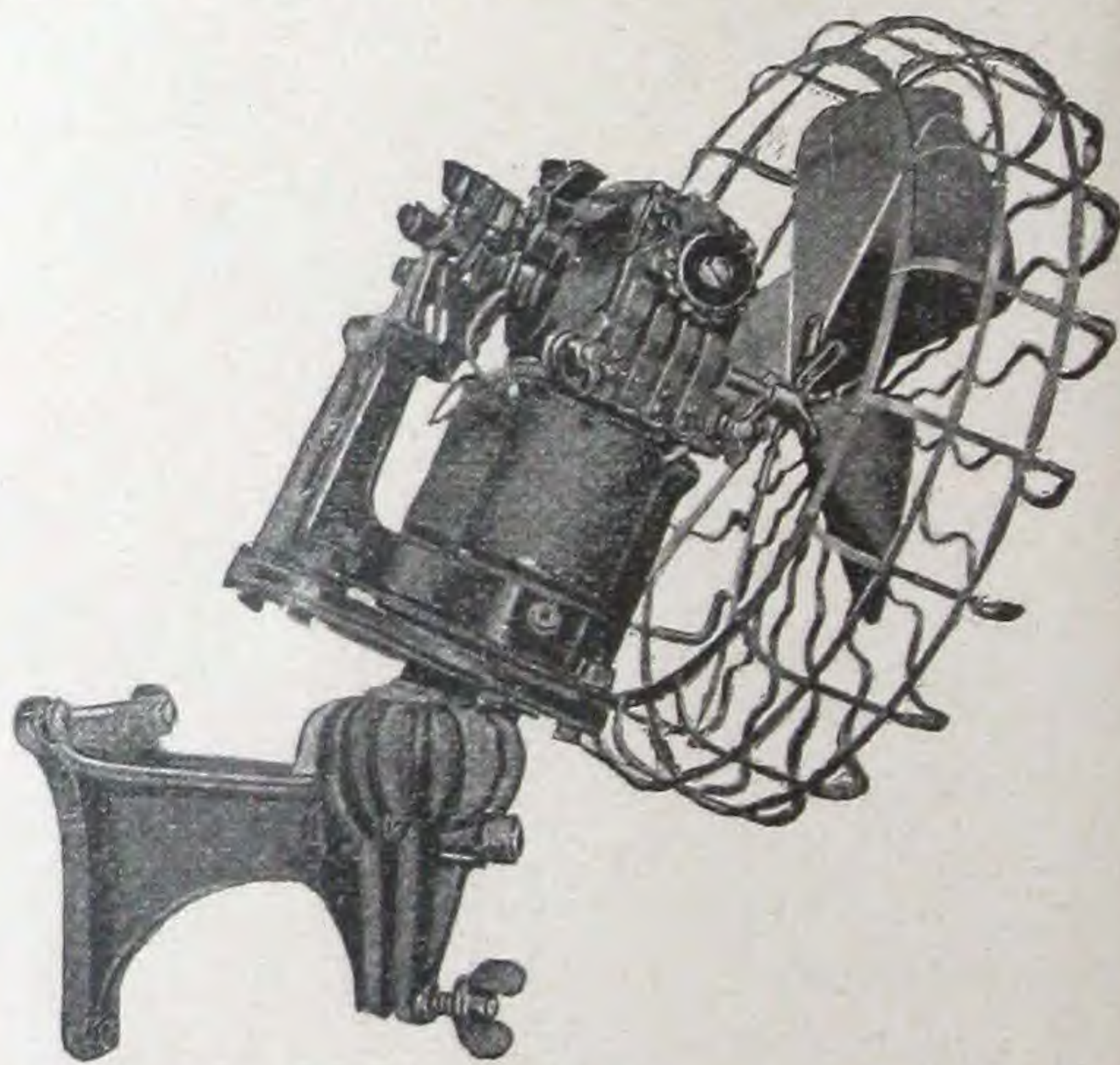
Desk.

In designing these fans, features of simplicity and durability have had first consideration, but at the same time great attention has been given to making them pleasing to the eye. The workmanship and material used in their manufacture is of the best.

Our bracket fan, which is undoubtedly the greatest novelty in the fan motor line this year, is arranged so that the motor may be thrown in any position. This convenient arrangement has been secured by mounting the motor on a bracket fitted with a ball and socket joint. The bracket is arranged to be screwed on the wall and then by

simply turning a thumb screw the motor can be adjusted to any desired angle and a breeze thrown in any part of the room.

We carry a large stock of these fans on hand, but so that your orders may be promptly filled, we would suggest that you place them early and not wait until the hot weather when there might be some slight delay.



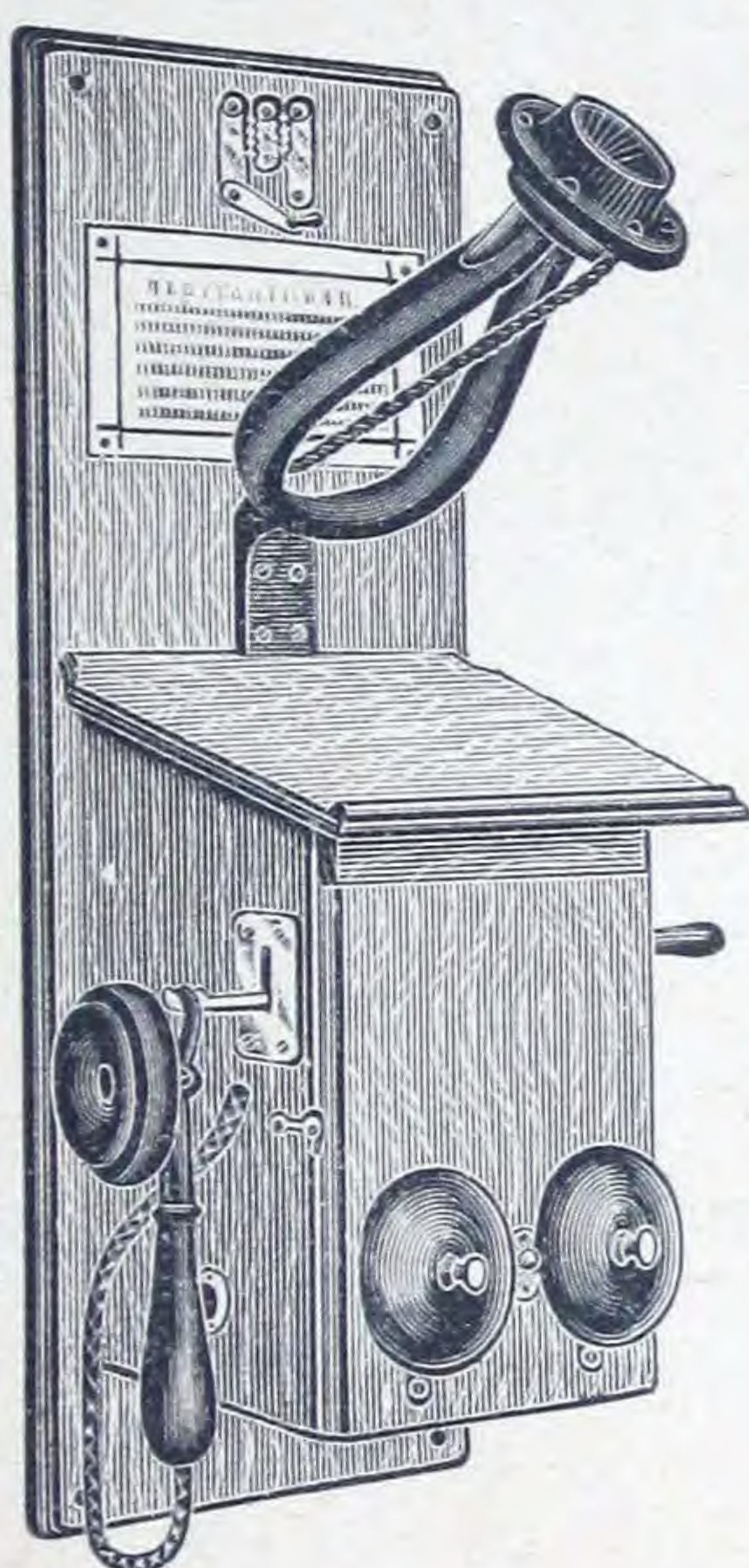
Bracket.

Trade Word.	List No.	Style.	Horse Power.	Size Fan. Inches.	Voltage.	Price.
Salaratus -----	3232	Bracket	$\frac{1}{2}$	12	110	\$35 00
Salicine -----	3233	Desk	$\frac{1}{2}$	12	110	30 00
Saliferous -----	3234	"	$\frac{1}{6}$	12	220	40 00
Salifiable -----	3235	"	$\frac{1}{6}$	12	500	40 00



## TELEPHONE.

## THE GILLILAND TELEPHONE COMPANY'S TELEPHONE.

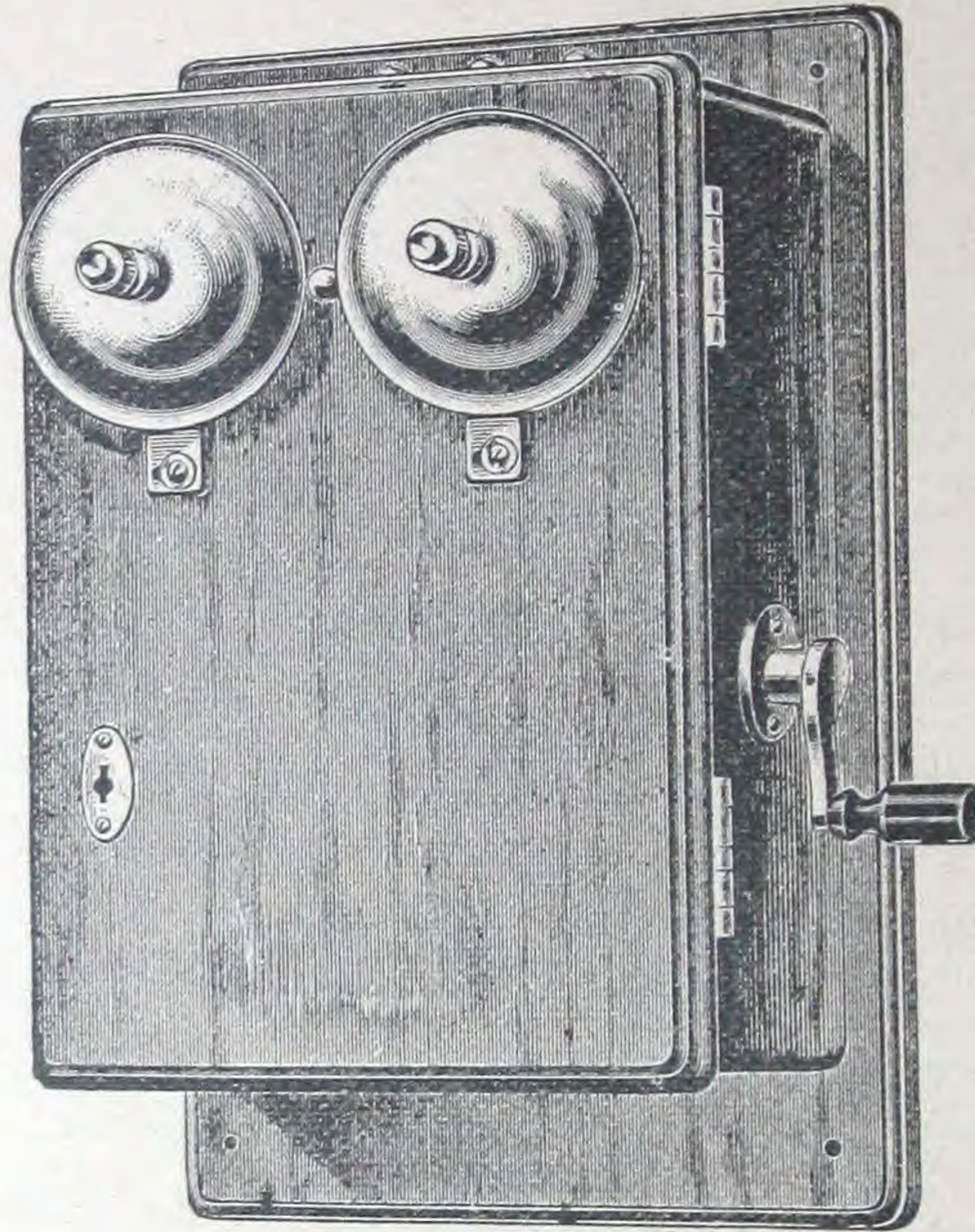


Trade Word.	List No.		Price.
Willemite	3959	Complete .....	each \$20 00
Willow	3960	Magnetos .....	" 11 75
Wimble	3961	Transmitters .....	" 5 50
Winch	3962	Hand telephones .....	" 2 75
Windage	3963	Switch boards .....	per drop 2 90
Window	3964	Speaking tubes, sets .....	on application.

Telephone exchange plants, private line construction, speaking tube systems and general telephone work performed under contract. Estimates furnished. Telephone apparatus sold outright.



## MAGNETO TESTING BELLS.

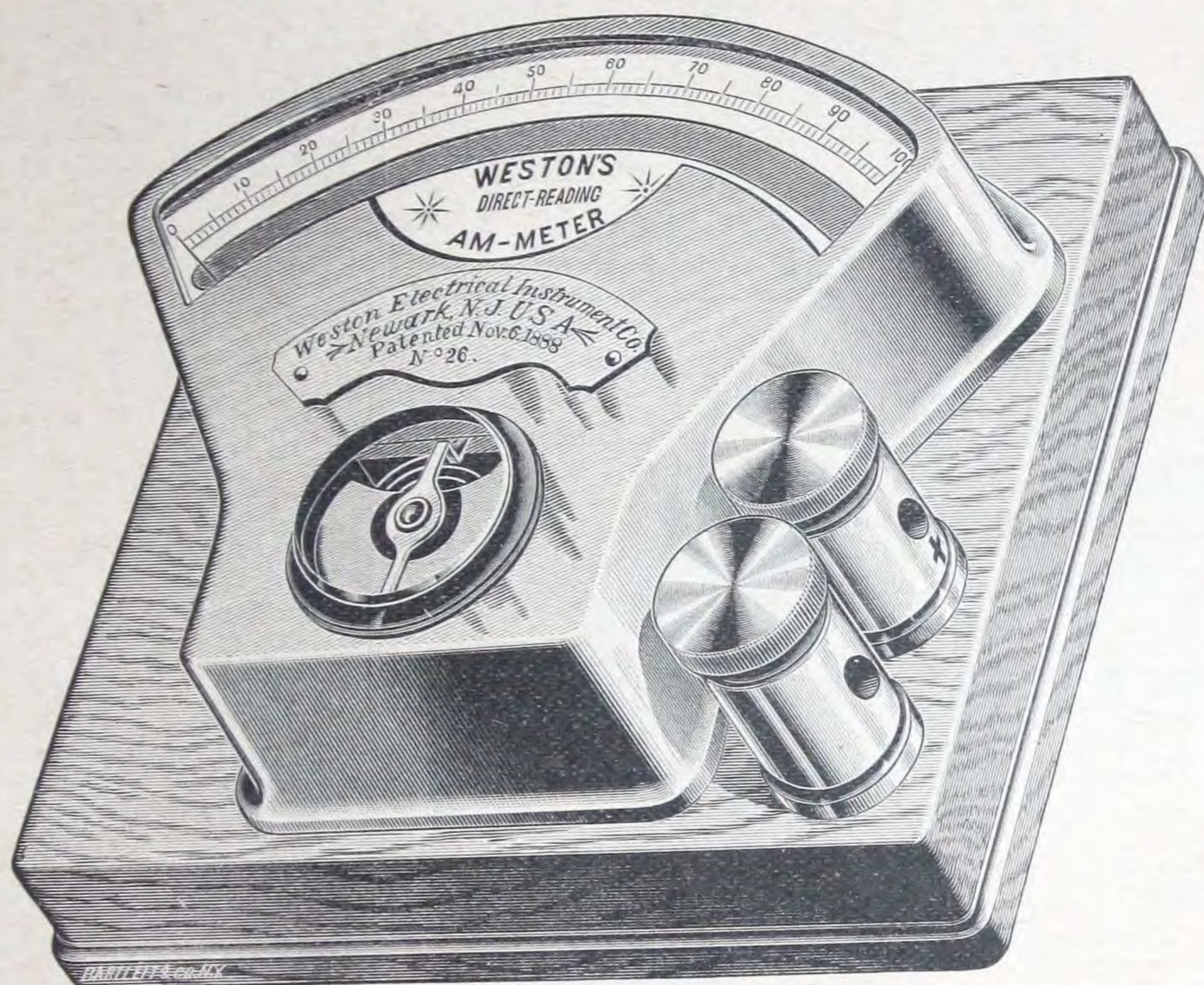


Trade Word.	List No.		Price.
Sandal	3925	Extra Standard Magneto, 50000 ohms.....each	\$40 00
Sandarac	3926	“ “ “ 25000 “ .....	16 00
Sandever	3927	“ “ “ 15000 “ .....	12 00
Sandiness	3928	Standard Magneto, 10000 ohms .....	8 00
Sandish	3929	Pony “ 5000 “ .....	6 50
Sandwich	3930	Shetland Pony Magneto, 4000 ohms.....	5 25
Sanguify	3931	Extension Bell, Standard.....	4 00
Sanhedrum	3932	“ “ Pony.....	3 25

“MAC” TAPE IS A STANDARD ARTICLE USED BY ALL  
GOOD WORKMEN.



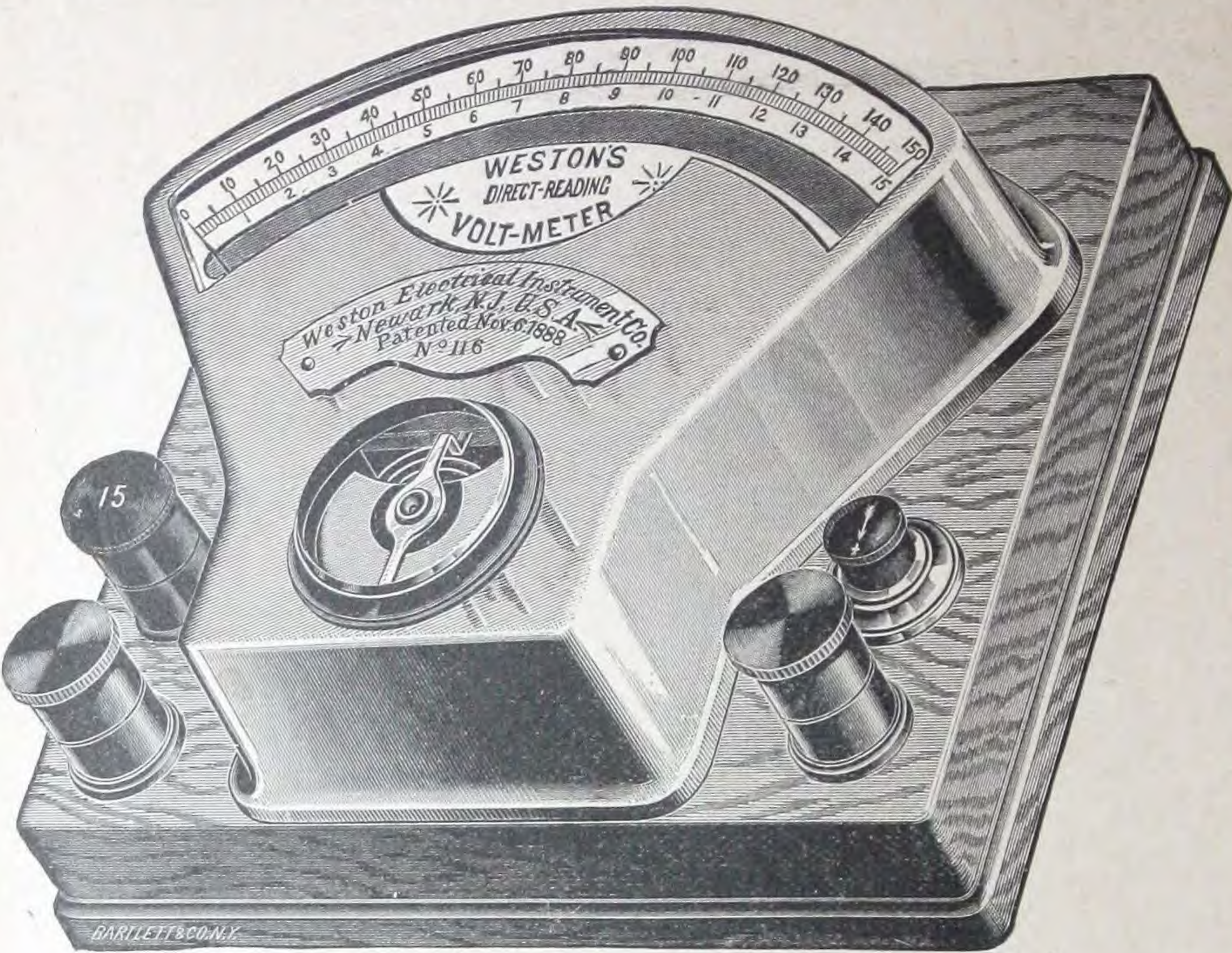
# WESTON'S STANDARD DIRECT-READING AMMETER.



Trade Word.	List No.		Price.
Saline	2511	5 ampere scale. Single scale divisions $\frac{1}{20}$ of an ampere, readable to $\frac{1}{200}$ of an ampere.....	each \$65 00
Saliva	2512	15 ampere scale. Single scale divisions $\frac{1}{10}$ of an ampere, readable to $\frac{1}{100}$ of an ampere.....	“ 65 00
Salivary	2513	25 ampere scale. Single scale divisions $\frac{1}{4}$ of an ampere, readable to $\frac{1}{40}$ of an ampere.....	“ 65 00
Salivate	2514	50 ampere scale. Single scale divisions $\frac{1}{2}$ of an ampere, readable to $\frac{1}{20}$ of an ampere.....	“ 65 00
Sallow	2515	100 ampere scale. Single scale divisions 1 ampere, readable to $\frac{1}{10}$ of an ampere.....	“ 70 00
Sally	2516	150 ampere scale. Single scale divisions 1 ampere, readable to $\frac{1}{10}$ of an ampere.....	“ 75 00
Salmagundi	2517	200 ampere scale.....	“ 80 00
Salisfy	2518	250 “ “.....	“ 80 00
Saltant	2519	300 “ “.....	“ 90 00
Saltation	2520	400 “ “.....	“ 90 00
Saltatory	2521	500 “ “.....	“ 90 00



WESTON'S STANDARD DIRECT-READING  
VOLTMETER.



Trade Word.	List No.		Price.
Saltern	2498	Scale 0 to 150 volts by single divisions readable to tenths.....	each \$55 00
Saltegrade	2499	Scale 0 to 150 volts by single volt divisions readable to tenths, contact key and calibrating coil....	" 60 00
Saltiness	2500	Scale 0 to 150 volts and 0 to 5 volts. Scale of double values with a ratio of 30. Each division on upper scale values is one volt readable to tenths; each division on lower scale values $\frac{1}{30}$ of a volt readable to $\frac{1}{300}$ . Contact key.....	" 75 00
Salubrious	2501	Scale 0 to 150 volts and 0 to 15 volts. Scale of double values with ratio of 10. Each division on upper scale values is one volt, readable to tenths; each division on lower scale values is $\frac{1}{10}$ of a volt readable to $\frac{1}{100}$ . Contact key....	" 75 00
Salubrity	2502	Scale 0 to 300 volts, by 2-volt divisions; readable to $\frac{1}{5}$ volt. Circuit key and calibrating coil....	" 65 00
Salute	2503	Scale 0 to 450 volts, by 3 divisions, readable to $\frac{1}{3}$ volt. Contact key and calibrating coil.....	" 70 00
Salutation	2504	Scale 0 to 600 volts, by 5-volt divisions, readable to $\frac{1}{2}$ volt.....	" 65 00
Salvatory	2505	Scale 0 to 600 volts, by 5-volt divisions, readable to $\frac{1}{2}$ volt. Contact key and calibrating coil....	" 70 00
Salvable	2506	Scale 0 to 600 volts and 0 to 150 volts. Scale of double values with ratio of 4, reading by 4-volt divisions, readable to $\frac{1}{2}$ volt on upper scale values; and by single volt divisions, readable to $\frac{1}{10}$ on lower scale values. Contact key.....	" 80 00
Salvage	2507	Scale 0 to 750 volts and 0 to 150 volts. Scale of double values with ratio of 5, reading by 5-volt divisions, readable to $\frac{1}{2}$ volt on upper scale values, and by single volt divisions, readable to $\frac{1}{10}$ volt on lower scale values. Contact key....	" 80 00



## ELECTRICAL BOOKS.

## ON TRANSMISSION OF POWER—STREET RAILWAYS, MOTORS.

	Price.
ATKINSON'S Electric Transformation of Power and its Application by the Electric Motor, including Electric Railway Construction. 240 pages, 96 illustrations	\$2 00
BADT'S Electric Transmission Hand-book. 97 pages, 22 illustrations, 27 tables	1 00
BOOTH'S Street Railway Law	6 00
BOTTONE'S Electro Motors: How made and how used. A Hand-book for Amateurs and Practical Men. 135 pages, 64 illustrations	50
COX'S Continuous Current Dynamos and Motors: Their Theory, Design and Testing. With Sections on Indicator Diagrams, Properties of Saturated Steam, Belting Calculations, etc. An Elementary Treatise for Students. 271 pages, 83 illustrations. This book gives the theory and design of continuous current dynamos and motors as understood and practiced in the designing room. The principles developed are explained by reference to numerical problems selected to cover as broad a field as possible, and show in what manner to make the various compromises always necessary in practical designing	2 00
CROCKER & WHEELER'S Practical Management of Dynamos and Motors, by F. B. Crocker and S. S. Wheeler. 107 pages, 38 illustrations	1 00
CROSBY & BELL'S Electric Railway in Theory and Practice, 182 illustrations	2 50
DAVIS' Standard Tables for Electric Wiremen; with Instructions for Wiremen and Linemen, Rules for Safe Wiring, Diagrams of Circuits and Useful Formulæ and Data. The wiring tables are all calculated on a uniform basis and arranged in a practical manner, and the other tables, the formulæ, data, etc., have been carefully prepared for practical use. Fourth edition, thoroughly revised and edited by W. D. Weaver. Bound in morocco for the pocket	1 00
DU MONCEL'S Electricity as a Motive Power. Translated and edited, with additions, by C. J. Wharton. Engravings and diagrams. 316 pages, 111 illustrations	3 00
FAIRCHILD'S Street Railways. A Practical Hand-book for Street Railway Men. Quarto, 426 pages, profusely illustrated	4 00
HAUPT'S Street Railway Motors, with Descriptions and Cost of Plants and Operation of the Various Systems in Use, or Proposed for Motive Power on Street Railways. 213 pages	1 75
HERING'S Recent Progress in Electric Railways: Being a Summary of Current Progress in Electric Railway Construction, Operation, Systems, Machinery, Appliances, etc. This volume contains a classified summary of the recent literature in this active branch of electrical progress, with descriptions of new apparatus and devices of general interest. 386 pages, 120 illustrations	1 00
HOUSTON'S Dictionary of Electrical Words, Terms and Phrases, Second edition. Entirely rewritten. Clear, intelligent, concise definitions of about 5000 separate electrical words, terms and phrases, with illustrated descriptions of electrical apparatus in general use and explanations of electrical phenomena. An indispensable reference book, not only for electricians, but for everyone interested in current progress. 562 double column octavo pages, 570 illustrations	5 00
HOUSTON'S Electrical Measurements and Other Advanced Primers of Electricity. The second volume of Advanced Primers, treating of the applications to dynamos, motors and batteries. 429 pages, 169 illustrations	1 00
JAMIESON'S Electricians' Pocket Companion, Electrical Rules, Tables, Tests and Formulæ of the Absolute Units, Electro-chemical Equivalents, Electrolysis, Heat and Energy of Combustion, Practical Methods of Electrical Measurements. Electric Conductors, Copper, etc. Insulators, Gutta-percha, etc. Submarine Cables, Aerial Land Lines. Electric Lighting and Transmission of Power. Fully illustrated	75
JOHNSTON'S Electrical and Street Railway Dictionary. Cloth, 786 pages	5 00
KAPP'S Alternating Currents of Electricity: Their Generation, Measurement, Distribution and Application. With an Introduction by William Stanley, Jr. 166 pages, 37 Illustrations, 2 plates	1 00
KAPP'S Electric Transmission of Energy, and its Transformation, Subdivision and Distribution. Third edition. 360 pages, 130 illustrations	3 00
KEMPE'S Electrical Engineer's Pocket-book of Modern Rules, Formula, Tables and Data. 248 pages, 50 illustrations	1 75
MARTIN & WETZLER'S Electric Motor and its Applications. Contents: Chapter I, Elementary Considerations; Chapter II, Early Motors and Experiments in Europe; Chapter III, Early Motors and Experiments in America; Chapter IV, The Electrical Transmission of Power; Chapter V, The Modern Electric Railway and Tramway in Europe; Chapter VI, The Modern Electric Railway and Street Car Line in America; Chapter VII, The Use of Storage Batteries with Electric Motors for Street Railways; Chapter VIII, The Industrial Application of Electric Motors in Europe; Chapter IX, The Industrial Application of Electric Motors in America; Chapter X, Electric Motors in Marine and Aerial Navigation; Chapter XI, Traction in America; Chapter XII, Latest American Motors and Motor Systems; Chapter XIII, Latest American Motors and Motor Systems, Continued; Chapter XIV, Latest European Motors and Motor Systems; Chapter XV, Alternating Current Motors; Chapter XVI, Thermomagnetic Motors; Appendix, by Dr. Louis Bell. The Development of the Electric Motor since 1888. Third edition, 315 large quarto pages, 353 illustrations	3 00
MAYCOCK'S Electric Lighting and Power Distribution, 125 illustrations	1 00
MERRILL'S Reference Book of Tables and Formulæ for Electric Street Railway Engineers, Flexible Morocco	1 00
MUNROE & JAMIESON'S Electrician's Pocket-book of Electrical Rules and Tables. New. Eighth edition. 677 pages	2 50
PARKHURST'S Dynamo and Motor Building for Amateurs. With Working Drawings. The most complete work of its kind, containing minute instructions, with figured drawings, how to make every part of a number of machines, from a toy motor to a 50-light incandescent dynamo. 163 pages, 22 illustrations	1 00
PARKHURST'S Electric Motor Construction for Amateurs. Illustrated	1 00
PRACTICAL ELECTRICAL ENGINEERING. A Complete Treatise on the Construction and Management of Electrical Apparatus as used in Electric Lighting and the Electric Transmission of Power. By eminent authorities. In 18 parts. Illustrated. Each part	75
Bound in 2 volumes. Each volume	7 50



ELECTRICAL BOOKS—Continued.

	Price.
PRINDLE'S Electric Railway of Today.....	\$0 50
RECKENZAUN'S Electric Traction as Applied to Tramways. By A. Reckenzaun. 443 pages. 213 illustrations.....	4 00
ROEBLING'S Hand-book of Tables for Electrical Engineers. 119 pages.....	1 50
SLOANE'S Electric Toy Making, Dynamo-Building and Electric Motor Construction. Treat- ing of the making at home of electric toys, electrical apparatus, motors, dynamos and elec- trical instruments. 140 pages, 53 illustrations.....	1 00
THOMPSON'S Dynamo-Electric Machinery. A Text Book for Students of Electro-Technics. By Prof. Silvanus P. Thomson. New. Fourth edition. Rewritten and revised. About 1000 pages, fully illustrated, 38 plates.....	9 00
TREVERI'S Electric Railway Engineering.....	2 00
WALSON'S Hand-book of Wiring Tables for Arc, Incandescent Lighting and Motor Circuits....	75
WATSON'S How to Make a One-Horse Motor or Dynamo. Illustrated.....	25

FEET EXPRESSED IN DECIMAL PARTS  
OF A MILE.

	Units.	10s.	100s.	1000s.
1.....	.0001894	.001894	.01894	.1894
2.....	.0003788	.003788	.03788	.3788
3.....	.0005682	.005682	.05682	.5682
4.....	.0007576	.007576	.07576	.7576
5.....	.0009469	.009469	.09469	.9469
6.....	.001136	.01136	.1136	----
7.....	.001326	.01326	.1326	----
8.....	.001515	.01515	.1515	----
9.....	.001704	.01704	.1704	----

Example: Express 4562 feet in decimal of a mile—

4,000 feet = .7576 miles.  
500 “ = .09469 miles.  
60 “ = .01136 miles.  
2 “ = .0003788 miles.

.8640288 miles.

That is 4562 feet equals .8640 miles.

GERMAN SILVER WIRE TABLE.

GIVING RESISTANCE PER 1000 FEET AND PER POUND OF  
GERMAN SILVER WIRE. (18% NICKEL.)

Gauge No. A. W. G.	Ohms per 1,000 Feet.	Ohms per Pound.	Gauge No. A. W. G.	Ohms per 1,000 Feet.	Ohms per Pound.
8.....	11.77	.2360	25.....	606.3	626.3
9.....	11.83	.3749	26.....	764.6	996.0
10.....	18.72	.5965	27.....	964.1	1584.
11.....	23.60	.9484	28.....	1216.	2518.
12.....	29.75	1.508	29.....	1533.	4004.
13.....	37.51	2.398	30.....	1933.	6368.
14.....	47.30	3.812	31.....	2437.	10120.
15.....	59.65	6.062	32.....	3074.	16100.
16.....	75.22	9.639	33.....	3876.	25590.
17.....	94.84	15.33	34.....	4888.	40710.
18.....	119.6	24.37	35.....	6164.	64730.
19.....	155.1	40.99	36.....	7771.	102900.
20.....	190.2	61.61	37.....	9797.	163500.
21.....	239.8	97.97	38.....	12360.	257800.
22.....	302.4	155.8	39.....	15570.	409500.
23.....	381.3	247.7	40.....	19650.	652000.
24.....	480.8	393.9			



## COMPARATIVE TABLE OF GAUGES.

GIVING THE RESPECTIVE DIAMETER AND AREA OF EACH NUMBER.

Gauge Number.	American Wire Gauge (Brown & Sharpe).		Birmingham Wire Gauge (Stubs).		Standard Wire Gauge.	
	Diameter. Inches.	Area. Circular Mils.	Diameter. Inches.	Area. Circular Mils.	Diameter. Inches.	Area. Circular Mils.
7-0					0.500	250000.
6-0					0.464	215300.
5-0					0.432	186600.
4-0	0.4600	211600.	0.454	206100	0.400	160000.
3-0	0.4096	167800.	0.425	180600	0.372	138400.
2-0	0.3648	133100.	0.380	144400	0.348	121100.
1-0	0.3249	105500.	0.340	115600	0.324	105000.
1	0.2893	83640.	0.300	90000	0.300	90000.
2	0.2576	66370.	0.284	80660	0.276	76180.
3	0.2294	52630.	0.259	67080	0.252	63500.
4	0.2043	41740.	0.238	56640	0.232	53820.
5	0.1819	33100.	0.220	48400	0.212	44940.
6	0.1620	26250.	0.203	41210	0.192	36860.
7	0.1443	20820.	0.180	32400	0.176	30980.
8	0.1285	16510.	0.165	27230	0.160	25600.
9	0.1144	13090.	0.148	21900	0.144	20740.
10	0.1019	10380.	0.134	17960	0.128	16380.
11	0.09074	8234.	0.120	14400	0.116	13460.
12	0.08081	6530.	0.109	11880	0.104	10820.
13	0.07196	5178.	0.0950	9025	0.092	8464.
14	0.06408	4107.	0.0830	6889	0.080	6400.
15	0.05707	3257.	0.0720	5184	0.072	5184.
16	0.05082	2583.	0.0650	4225	0.064	4096.
17	0.04526	2048.	0.0580	3364	0.056	3136.
18	0.04030	1624.	0.0490	2401	0.048	2304.
19	0.03589	1288.	0.0420	1764	0.040	1600.
20	0.03196	1022.	0.0350	1225	0.036	1296.
21	0.02846	810.1	0.0320	1024	0.032	1024.
22	0.02535	642.4	0.0280	784	0.028	784.0
23	0.02257	509.5	0.0250	625	0.024	576.0
24	0.02010	404.0	0.0220	484	0.022	484.0
25	0.01790	320.4	0.0200	400	0.020	400.0
26	0.01594	254.1	0.0180	324	0.018	324.0
27	0.01420	201.5	0.0060	256	0.0164	269.0
28	0.01264	159.8	0.0140	196	0.0148	219.0
29	0.01126	126.7	0.0130	169	0.0136	185.0
30	0.01003	100.5	0.0120	144	0.0124	153.8
31	0.008928	79.70	0.0100	100	0.0116	134.6
32	0.007950	63.21	0.0090	81	0.0108	116.6
33	0.007080	50.13	0.0080	64	0.0100	100.0
34	0.006305	39.75	0.0070	49	0.0092	84.64
35	0.005615	31.52	0.0050	25	0.0084	70.56
36	0.005000	25.00	0.0040	16	0.0076	57.76
37	0.004453	19.83			0.0068	46.24
38	0.003965	15.72			0.0060	36.00
39	0.003531	12.47			0.0052	27.04
40	0.003145	9.888			0.0048	23.04
41					0.0044	19.36



COPPER WIRE TABLE.

AMERICAN WIRE GAUGE (Browne & Sharpe).

Giving weights, lengths and resistances of soft copper wires of Mathiessen's standard conductivity at a temperature of 24° C. (75.2° F.).

Gauge. A. W. G. B. & S.	Diam. Inches.	Area. Circular Mils.	WEIGHT.		LENGTH.		RESISTANCE.	
			Lbs. per 1000 Feet.	Lbs. per Ohm.	Feet per Pound.	Feet per Ohm.	Ohms per 1000 Feet.	Ohms per Pound.
0000	0.4600	211600.	640.5	12890.	1.561	20130.	0.04967	0.00007755
000	0.4096	167800.	508.0	8107.	1.969	15960.	0.06264	0.0001234
00	0.3648	133100.	402.8	5101.	2.482	12660.	0.07898	0.0001960
0	0.3249	105500.	319.5	3207.	3.130	10040.	0.09960	0.0003118
1	0.2893	83690.	253.3	2017.	3.947	7963.	0.1256	0.0004957
2	0.2576	66370.	200.9	1269.	4.977	6314.	0.1584	0.0007883
3	0.2294	52630.	159.3	798.3	6.276	5008.	0.1997	0.001254
4	0.2043	41740.	126.4	501.8	7.914	3971.	0.2518	0.001993
5	0.1819	33100.	100.2	315.5	9.980	3149.	0.3176	0.003170
6	0.1620	26250.	79.46	198.5	12.58	2497.	0.4004	0.005039
7	0.1443	20820.	63.02	124.8	15.87	1981.	0.5048	0.008012
8	0.1285	16510.	49.98	78.49	20.01	1571.	0.6367	0.01274
9	0.1144	13090.	39.63	49.37	25.23	1246.	0.8028	0.02025
10	0.1019	10380.	31.43	31.04	31.82	987.8	1.012	0.03221
11	0.09074	8234.	24.93	19.54	40.12	783.6	1.276	0.05122
12	0.08081	6530.	19.77	12.28	50.59	621.2	1.610	0.08144
13	0.07196	5178.	15.68	7.722	63.79	492.7	2.029	0.1295
14	0.06408	4107.	12.43	4.857	80.44	390.7	2.559	0.2059
15	0.05707	3257.	9.858	3.054	101.4	309.8	3.227	0.3274
16	0.05082	2583.	7.818	1.922	127.9	245.7	4.070	0.5206
17	0.04526	2048.	6.200	1.208	161.3	194.9	5.132	0.8277
18	0.04030	1624.	4.917	0.7599	203.4	154.5	6.471	1.316
19	0.03589	1288.	3.899	0.4779	256.5	122.5	8.160	2.092
20	0.03196	1022.	3.092	0.3005	323.4	97.14	10.29	3.328
21	0.02846	810.1	2.452	0.1890	407.8	77.07	12.97	5.291
22	0.02535	642.4	1.945	0.1189	514.2	61.10	16.37	8.413
23	0.02257	509.5	1.542	0.07475	648.4	48.47	20.63	13.38
24	0.02010	404.0	1.223	0.04702	817.6	38.43	26.02	21.27
25	0.01790	320.4	0.9699	0.02956	1031.0	30.49	32.80	33.83
26	0.01594	254.1	0.7692	0.01859	1300.0	24.17	41.37	53.78
27	0.01420	201.5	0.6100	0.01169	1639.0	19.17	52.16	85.51
28	0.01264	159.8	0.4837	0.007359	2067.0	15.20	65.78	135.9
29	0.01126	126.7	0.3836	0.004626	2607.0	12.06	82.94	216.2
30	0.01003	100.5	0.3042	0.002909	3287.0	9.563	104.6	343.8
31	0.008928	79.70	0.2413	0.001829	4145.0	7.583	131.9	546.6
32	0.007950	63.21	0.1913	0.001150	5227.0	6.013	166.3	869.2
33	0.007080	50.13	0.1517	0.0007237	6591.0	4.768	209.7	1382.
34	0.006305	39.75	0.1203	0.0004550	8311.0	3.781	264.5	2198.
35	0.005615	31.52	0.09543	0.0002863	10480.0	2.999	333.4	3493.
36	0.005000	25.00	0.07568	0.0001800	13210.0	2.378	420.5	5556.
37	0.004453	19.83	0.06001	0.0001132	16660.0	1.886	530.2	8834.
38	0.003965	15.72	0.04759	0.00007101	21010.0	1.496	668.5	14080.
39	0.003531	12.47	0.03774	0.00004478	26500.0	1.186	843.0	22330.
40	0.003145	9.888	0.02993	0.00002816	33410.0	0.9408	1063.	35510.

This table is based on the following values: Resistance in terms of the international ohm. Specific gravity of copper = 8.89. Mathiessen's standard resistivity one metre-gramme of soft copper = 0.14365 B. A. U. @ 0°C. Mathiessen's temperature coefficient = 1.09612 @ 24°C. One metre-gramme of soft copper = 0.141729 international ohms @ 0°C.



## CONDUCTORS.

The weight and resistance per mile of round wire, where  $d$  is the diameter in mills, are:

For Copper Wire	Weight. $\frac{d^2}{62.5}$ Pounds.	Resistance at 75 degrees. $\frac{56970}{d^2}$ Ohms.
For Iron Wire	$\frac{d^2}{72}$ Pounds.	$\frac{380060}{d^2}$ Ohms.

Copper wire is approximately  $1\frac{1}{7}$  times the weight of an iron wire of the same size.

A copper wire 334 circular mills in cross section and 1,000 feet in length, weighs one pound.

The resistance of copper increases as the temperature rises about .21 per cent for each degree Fahrenheit, while that of iron increases about .39 per cent.

## BREAKING STRAIN AND ELONGATION OF COPPER WIRE.

No. B. W. Gauge.	Diameter, Inches.	SOFT COPPER.		HARD COPPER.	
		Breaking Strain, Pounds.	Elongation, Per Cent.	Breaking Strain, Pounds.	Elongation, Per Cent.
20	.035	40	35	70	$1\frac{1}{4}$
18	.049	75	37	135	$1\frac{1}{4}$
16	.065	120	37	240	$1\frac{1}{4}$
14	.083	205	37	360	
12	.109	335	38	625	-----
10	.134	480	23	880	-----
8	.165	745	24	1265	-----
6	.203	1120	36	-----	-----
5	.220	1325	41	-----	-----
4	.238	1510	37	-----	-----
3	.254	1750	47	-----	-----
2	.289	2165	38	3640	3



TABLE OF DECIMAL EQUIVALENTS

OF 8THS, 16THS, 32DS, AND 64THS OF AN INCH.

FOR USE IN CONNECTION WITH THE MICROMETER CALIPER.

8ths.	$\frac{9}{16} = .5625$	$\frac{17}{32} = .53125$	$\frac{9}{64} = .140625$	$\frac{37}{64} = .578125$
$\frac{1}{8} = .125$	$\frac{11}{16} = .6875$	$\frac{19}{32} = .59375$	$\frac{11}{64} = .171875$	$\frac{39}{64} = .609375$
$\frac{1}{4} = .250$	$\frac{13}{16} = .8125$	$\frac{21}{32} = .65625$	$\frac{13}{64} = .203125$	$\frac{41}{64} = .640625$
$\frac{3}{8} = .375$	$\frac{15}{16} = .9375$	$\frac{23}{32} = .71875$	$\frac{15}{64} = .234375$	$\frac{43}{64} = .671875$
$\frac{1}{2} = .500$	32ds.	$\frac{25}{32} = .78125$	$\frac{17}{64} = .265625$	$\frac{45}{64} = .703125$
$\frac{5}{8} = .625$	$\frac{1}{32} = .03125$	$\frac{27}{32} = .84375$	$\frac{19}{64} = .296875$	$\frac{47}{64} = .734375$
$\frac{3}{4} = .750$	$\frac{3}{32} = .09375$	$\frac{29}{32} = .90625$	$\frac{21}{64} = .328125$	$\frac{49}{64} = .765625$
$\frac{7}{8} = .875$	$\frac{5}{32} = .15625$	$\frac{31}{32} = .96875$	$\frac{23}{64} = .359375$	$\frac{51}{64} = .796875$
16ths.	$\frac{7}{32} = .21875$	64ths.	$\frac{25}{64} = .390625$	$\frac{53}{64} = .828125$
$\frac{1}{16} = .0625$	$\frac{9}{32} = .28125$	$\frac{1}{64} = .015625$	$\frac{27}{64} = .421875$	$\frac{55}{64} = .859375$
$\frac{3}{16} = .1875$	$\frac{11}{32} = .34375$	$\frac{3}{64} = .046875$	$\frac{29}{64} = .453125$	$\frac{57}{64} = .890625$
$\frac{5}{16} = .3125$	$\frac{13}{32} = .40625$	$\frac{5}{64} = .078125$	$\frac{31}{64} = .484375$	$\frac{59}{64} = .921875$
$\frac{7}{16} = .4375$	$\frac{15}{32} = .46875$	$\frac{7}{64} = .109375$	$\frac{33}{64} = .515625$	$\frac{61}{64} = .953125$
			$\frac{35}{64} = .546875$	$\frac{63}{64} = .984375$

EQUIVALENTS OF WIRES.

BROWN & SHARPE'S GAUGE.

0000	2 No. 0	4 No. 3	8 No. 6	16 No. 9	32 No. 12	64 No. 15
000	2 " 1	4 " 4	8 " 7	16 " 10	32 " 13	64 " 16
00	2 " 2	4 " 5	8 " 8	16 " 11	32 " 14	64 " 17
0	2 " 3	4 " 6	8 " 9	16 " 12	32 " 15	64 " 18
1	2 " 4	4 " 7	8 " 10	16 " 13	32 " 16	-----
2	2 " 5	4 " 8	8 " 11	16 " 14	32 " 17	-----
3	2 " 6	4 " 9	8 " 12	16 " 15	32 " 18	-----
4	2 " 7	4 " 10	8 " 13	16 " 16	-----	-----
5	2 " 8	4 " 11	8 " 14	16 " 17	-----	-----
6	2 " 9	4 " 12	8 " 15	16 " 18	-----	-----
7	2 " 10	4 " 13	8 " 16	-----	-----	-----
8	2 " 11	4 " 14	8 " 17	-----	-----	-----
9	2 " 12	4 " 15	8 " 18	-----	-----	-----
10	2 " 13	4 " 16	-----	-----	-----	-----
11	2 " 14	4 " 17	-----	-----	-----	-----
12	2 " 15	4 " 18	-----	-----	-----	-----
13	2 " 16	-----	-----	-----	-----	-----
14	2 " 17	-----	-----	-----	-----	-----
15	2 " 18	-----	-----	-----	-----	-----



## WIRE TABLES AND FORMULA.

Safe carrying capacity in amperes of copper conductors as recommended by the Fire Underwriters' Association.

Circular Mils.	Capacity in Amperes.	Circular Mils.	Capacity in Amperes.	Circular Mils.	Capacity in Amperes.
1,000,000	695	600,000	440	375,000	290
950,000	660	550,000	405	350,000	275
900,000	630	500,000	370	325,000	255
850,000	600	475,000	355	300,000	240
800,000	565	450,000	340	275,000	225
750,000	535	425,000	320	250,000	210
700,000	500	400,000	305	225,000	200
650,000	470				

## BROWN &amp; SHARPE.

Gauge No.	Amperes.
0000	175
000	145
00	120
0	100
1	95
2	70
3	60
4	50
5	45
6	35
7	30
8	25
10	20
12	15
14	10
16	5
18	3

## BIRMINGHAM.

Gauge No.	Amperes.
0000	175
000	150
00	130
0	110
1	95
2	85
3	75
4	65
5	60
6	50
7	45
8	35
10	30
12	20
14	15
16	10
18	5
20	3

## EDISON STANDARD.

Gauge No.	Amperes.
200	175
180	160
140	135
110	110
90	95
80	85
65	75
55	65
50	60
40	50
30	40
25	35
20	30
12	20
8	15
5	10
3	5
2	3

TO INSULATE JOINTS USE "MAC" TAPE.



## WEIGHT OF MACHINE BOLTS PER 100.

Diameter.	$\frac{1}{4}$	5-16	$\frac{3}{8}$	7-16	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Length.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
$1\frac{1}{2}$	3.37	6.	9.68	13.81	17.62	33.87	-----	-----	-----
$1\frac{3}{4}$	3.81	6.50	10.43	14.68	21.25	35.81	-----	-----	-----
2	4.12	7.	11.18	15.68	22.43	38.25	59.31	-----	-----
$2\frac{1}{4}$	4.38	7.50	11.68	16.68	23.87	40.25	61.87	-----	-----
$2\frac{1}{2}$	4.85	8.	12.25	17.68	25.37	42.25	65.	103.12	-----
$2\frac{3}{4}$	5.30	8.50	13.68	18.68	26.50	44.25	68.12	109.38	-----
3	5.80	9.	14.06	19.68	27.80	46.25	70.62	115.	-----
$3\frac{1}{2}$	6.30	10.	15.68	21.68	30.40	50.25	76.62	123.	-----
4	7.25	11.	17.20	23.68	33.	54.25	82.62	131.	177.50
$4\frac{1}{2}$	7.90	12.	18.73	25.68	35.48	58.25	88.62	139.	188.04
5	8.80	13.	20.26	27.68	38.08	62.25	94.62	147.	198.58
$5\frac{1}{2}$	9.70	14.	21.70	29.68	40.68	66.25	100.62	155.	209.12
6	10.60	15.	23.20	31.68	43.28	70.25	106.62	163.	219.66
$6\frac{1}{2}$	-----	-----	24.73	33.68	45.88	74.25	112.62	171.	230.20
7	-----	-----	26.26	35.68	48.88	78.25	118.62	179.	240.74
$7\frac{1}{2}$	-----	-----	27.80	37.68	50.08	82.25	124.62	187.	251.28
8	-----	-----	29.32	39.68	52.68	86.25	130.62	195.	261.82
9	-----	-----	-----	43.68	57.88	94.25	142.92	212.	283.82
10	-----	-----	-----	47.68	63.08	102.25	155.22	229.	305.82
11	-----	-----	-----	51.68	68.28	110.25	167.52	246.	327.82
12	-----	-----	-----	55.68	73.88	118.25	179.82	263.	349.82
13	-----	-----	-----	-----	79.48	126.25	192.12	280.	371.82
14	-----	-----	-----	-----	85.08	134.25	204.42	297.	393.82
15	-----	-----	-----	-----	90.68	142.25	216.72	314.	415.82
16	-----	-----	-----	-----	96.28	150.25	229.02	331.	437.82
17	-----	-----	-----	-----	101.88	158.25	241.32	348.	459.82
18	-----	-----	-----	-----	107.48	166.25	253.62	365.	481.82
19	-----	-----	-----	-----	113.08	174.20	265.92	382.	503.82
20	-----	-----	-----	-----	118.68	182.25	278.22	399.	525.82



# WEIGHT OF ROUND IRON PER LINEAL FOOT.

Diam.	Wght.	Diam.	Wght.	Diam.	Wght.	Diam.	Wght.	Diam.	Wght.	Diam.	Wght.
$\frac{1}{16}$	.010	$\frac{9}{16}$	.840	$1\frac{1}{16}$	2.997	$1\frac{5}{8}$	7.010	$2\frac{5}{8}$	18.293	$4\frac{1}{4}$	47.952
$\frac{1}{8}$	.041	$\frac{5}{8}$	1.043	$1\frac{1}{8}$	3.360	$1\frac{3}{4}$	8.128	$2\frac{3}{4}$	20.076	$4\frac{1}{2}$	53.760
$\frac{3}{16}$	.094	$1\frac{1}{16}$	1.255	$1\frac{3}{16}$	3.744	$1\frac{7}{8}$	9.333	$2\frac{7}{8}$	21.944	$4\frac{3}{4}$	59.900
$\frac{1}{4}$	.165	$\frac{3}{4}$	1.493	$1\frac{1}{4}$	4.172	2	10.616	3	23.888	5	66.752
$\frac{5}{16}$	.261	$1\frac{3}{16}$	1.752	$1\frac{5}{16}$	4.573	$2\frac{1}{8}$	11.988	$3\frac{1}{4}$	28.040	$5\frac{1}{4}$	73.172
$\frac{3}{8}$	.373	$\frac{7}{8}$	2.032	$1\frac{3}{8}$	5.019	$2\frac{1}{4}$	13.440	$3\frac{1}{2}$	32.512	$5\frac{1}{2}$	80.304
$\frac{7}{16}$	.508	$1\frac{5}{16}$	2.333	$1\frac{7}{16}$	5.486	$2\frac{3}{8}$	14.975	$3\frac{3}{4}$	37.332	$5\frac{3}{4}$	87.776
$\frac{1}{2}$	.663	1	2.654	$1\frac{1}{2}$	5.972	$2\frac{1}{2}$	16.688	4	42.464	6	95.552

# WEIGHT OF SQUARE IRON PER LINEAL FOOT.

Size.	Wght.	Size.	Wght.	Size.	Wght.	Size.	Wght.	Size.	Wght.	Size.	Wght.
$\frac{1}{16}$	.013	$\frac{9}{16}$	1.069	$1\frac{1}{16}$	3.816	2	13.520	3	30.416	$4\frac{1}{4}$	61.055
$\frac{1}{8}$	.053	$\frac{5}{8}$	1.320	$1\frac{1}{8}$	4.278	$2\frac{1}{8}$	15.263	$3\frac{1}{8}$	33.010	$4\frac{1}{2}$	68.448
$\frac{3}{16}$	.119	$1\frac{1}{16}$	1.597	$1\frac{1}{4}$	5.280	$2\frac{1}{4}$	17.112	$3\frac{1}{4}$	35.704	$4\frac{3}{4}$	76.264
$\frac{1}{4}$	.211	$\frac{3}{4}$	1.901	$1\frac{3}{8}$	6.390	$2\frac{3}{8}$	19.066	$3\frac{3}{8}$	38.503	5	84.480
$\frac{5}{16}$	.330	$1\frac{3}{16}$	2.231	$1\frac{1}{2}$	7.604	$2\frac{1}{2}$	21.120	$3\frac{1}{2}$	41.408	$5\frac{1}{4}$	93.168
$\frac{3}{8}$	.475	$\frac{7}{8}$	2.588	$1\frac{5}{8}$	8.926	$2\frac{5}{8}$	23.292	$3\frac{5}{8}$	44.418	$5\frac{1}{2}$	102.240
$\frac{7}{16}$	.647	$1\frac{5}{16}$	2.971	$1\frac{3}{4}$	10.352	$2\frac{3}{4}$	25.560	$3\frac{3}{4}$	47.534	$5\frac{3}{4}$	111.756
$\frac{1}{2}$	.845	1	3.380	$1\frac{7}{8}$	11.888	$2\frac{7}{8}$	27.939	4	54.084	6	121.664



LINE CONSTRUCTION.

APPROXIMATE.

Compiled by George W. Knox, Electrician Chicago City Railway Company.

	One mile straight Single Track.	One mile straight Double Track.	One Single Track Curve.	One Double Track Curve.	One 200 ft. Turn- out.	One mile Bracket Construction.	Distance apart of Curve Pull-overs.	Height of Trolley Wire.
Straight Line Hangers-----	45	90	-----	-----	-----	-----	-----	-----
Single Curve Pull-overs-----	-----	-----	7	7	2	-----	-----	-----
Double Curve Pull-overs-----	-----	-----	2	12	4	-----	-----	-----
Single Ear Strain Clamps ---	2	4	2	4	-----	2	-----	-----
Double Ear Strain Clamps-----	-----	2	-----	-----	-----	-----	-----	-----
Turn Out Switches -----	-----	-----	-----	-----	2	-----	-----	-----
Strain Insulators -----	100	110	4	6	-----	-----	-----	-----
Feed in Clamps-----	6	12	-----	-----	-----	6	-----	-----
Pole Ratchets or Eye Bolts --	90	90	-----	-----	-----	-----	-----	-----
Rail Bonds, single bonding --	350	700	-----	-----	-----	350	-----	-----
Cross Bonds, 60 in. -----	85	200	-----	-----	-----	85	-----	-----
Soft Drawn Copper Wire, Sup- plementary -----	6000 ft.	14000 ft.	-----	-----	-----	6000 ft.	-----	-----
Hard Drawn Copper Trolley Wire-----	5350 ft.	10700 ft.	-----	-----	200 ft.	5350 ft.	-----	-----
Steel Span Wire, $\frac{5}{16}$ inch-----	3500 ft.	5000 ft.	500 ft.	600 ft.	800 ft.	-----	-----	-----
Feeder Wire -----	5000 ft.	-----	-----	-----	-----	5000 ft.	-----	-----
Octagonal or Cedar Side Poles, 120 feet apart -----	90	90	-----	-----	-----	45	-----	-----
Extra Heavy Poles -----	4	4	3	3	-----	-----	-----	-----
Feet-----	-----	-----	-----	-----	-----	-----	6	20
Pipe Bracket Hangers -----	-----	-----	-----	-----	-----	45	-----	-----
Center Poles, 120 feet apart--	45	45	-----	-----	-----	-----	-----	-----



## ADDENDA.

---

### BADGER LINE MATERIAL.

The advantages which the Badger State has offered to produce a perfect line of overhead material is perhaps the only reason this material is so named. The extensive trolley lines in this state has given experience in line material which could not be obtained elsewhere, and after overcoming the various faults as they developed, a line of material which has proven a success in every detail was the result. Not only was efficiency and durability sought after in perfecting this material, but also cheapness, and we are able through the simplicity of its design to offer this material at very low figures.

The absence of solder in applying this material, is also one of the features to recommend it.

The material and workmanship is of the highest order and special care is taken in having all parts of a uniform standard and interchangeable.

### MALLEABLE IRON.

#### RESULTS OF PRACTICAL EXPERIMENTS.

This metal has not been extensively used for overhead parts, mostly from the fear of corrosion, yet this has never been thought a serious objection to the use of iron for turn-buckles, span wire, etc. The harder qualities and cheaper prices of Malleable Iron has induced us to make a set of switches from this metal and after they were in use two years no wear was apparent, while the corrosion was insignificant, and it is from this test that this metal is recommended in preference to brass for these over-head parts.



BADGER LINE MATERIAL.



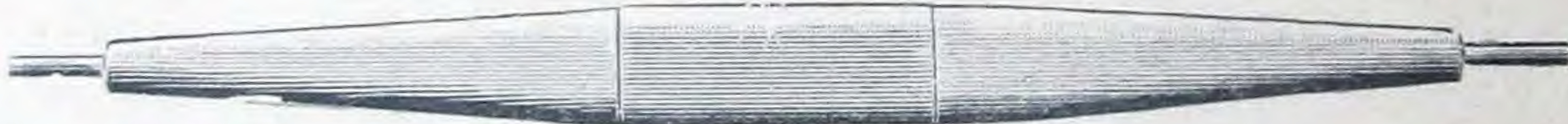
BADGER MECHANICAL CLAMP.

The trolley clamp is an improved form of mechanical clamp. Its principle being to do away with all screws, nuts, or other devices having threads to hold the trolley wire to the insulator. This is accomplished by having molded into the bell a taper stud (instead of usual threaded stud) which wedges between the two parts of the clamp, holding the trolley wire firmly, and a split pin is inserted in a hole at lower end of stud preventing clamp from coming off again.

This clamp is very simple to hang, a hammer is the only tool which is necessary, this being of great advantage in cold weather.

Trade Word.	List No.	Price.
Wanton	5499	\$0 40

BADGER CIRCUIT BREAKER.



End View.

To be used at feeder section or in place of insulated cross-over, is simple to put up and requires no solder.

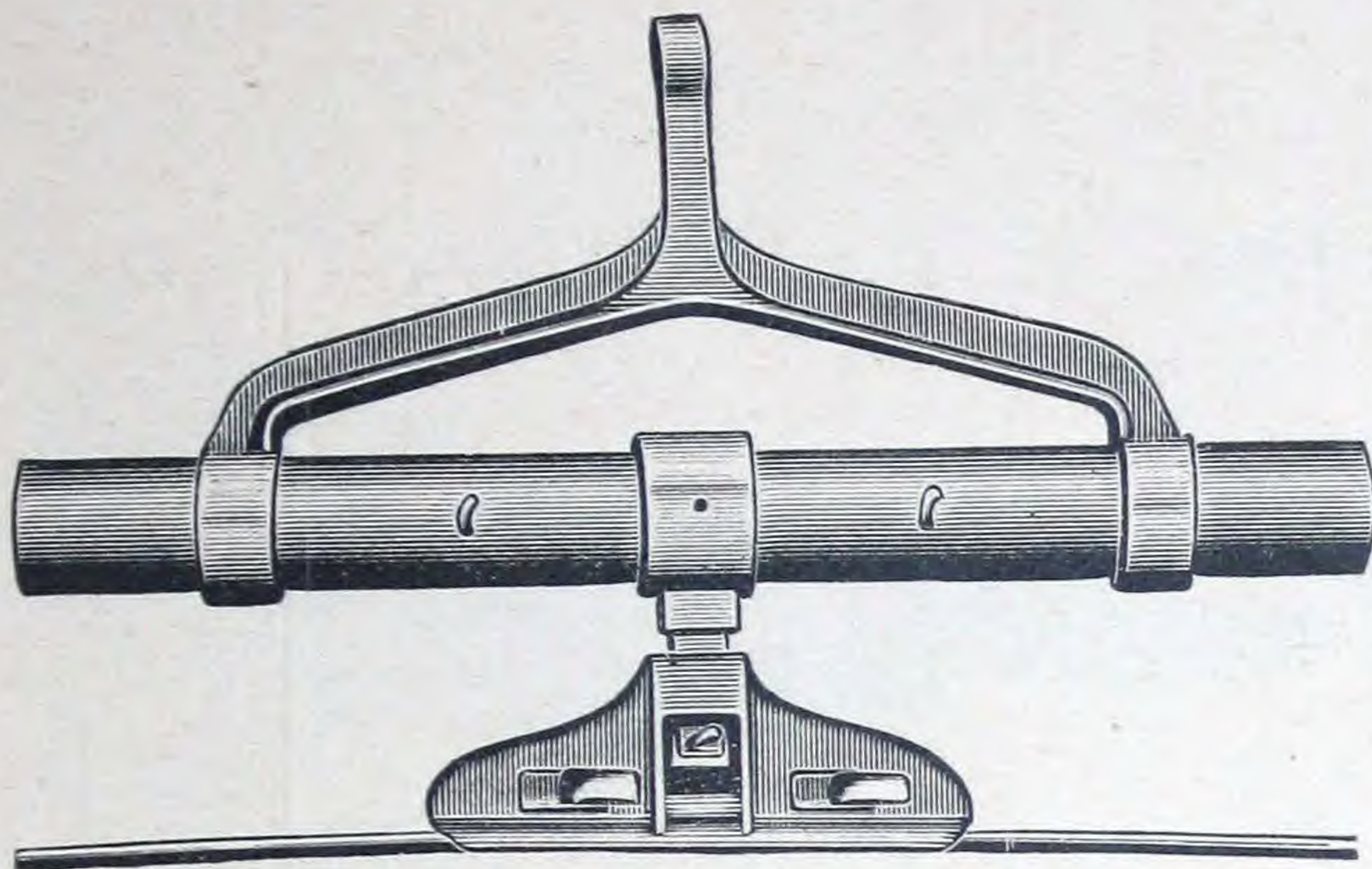


Side View.

Trade Word.	List No.	Price.
Wantonize	5522	Fiber Center Insulation Ends, Brass Castings, each \$2 50



## BADGER LINE MATERIAL.



BADGER HANGER.

A simple device for holding the trolley wire to center poles of rigid structures. The hanger is made of malleable iron.

The insulation is a piece of maple well soaked in paraffine and P. & B. which allows the trolley wires to move in all directions, avoiding the usual breaks of rigid fastenings; can also be used for span wire construction.

Trade Word.	List No.		Price.
Waped	5515	Malleable iron without clamp stud to fit any clamp .....	each \$0 90
Wapiti	5515 A	Malleable iron with clamp .....	" 1 30
Wappe	5515 B	Hard brass without clamp .....	" 1 50

## BADGER SLEEVE.



Showing how wire is held.

No solder required, by simply platting the wire it is firmly spliced together.

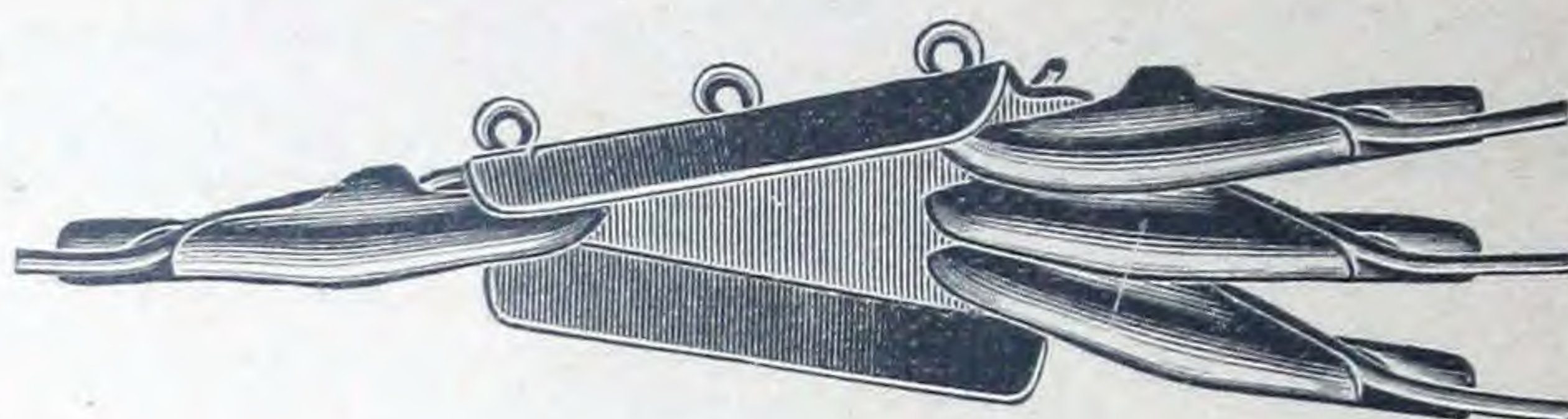


Sleeve in place.

Trade Word.	List No.		Price.
Wapper	5521	Malleable iron .....	each \$0 50
Warble	5521 B	Brass .....	" 80



## BADGER LINE MATERIAL.



## BADGER SWITCHES.

This line of material was designed to avoid the trolley jumping in crossing switches at high speeds and to avoid the excessive wear on trolley wheels.

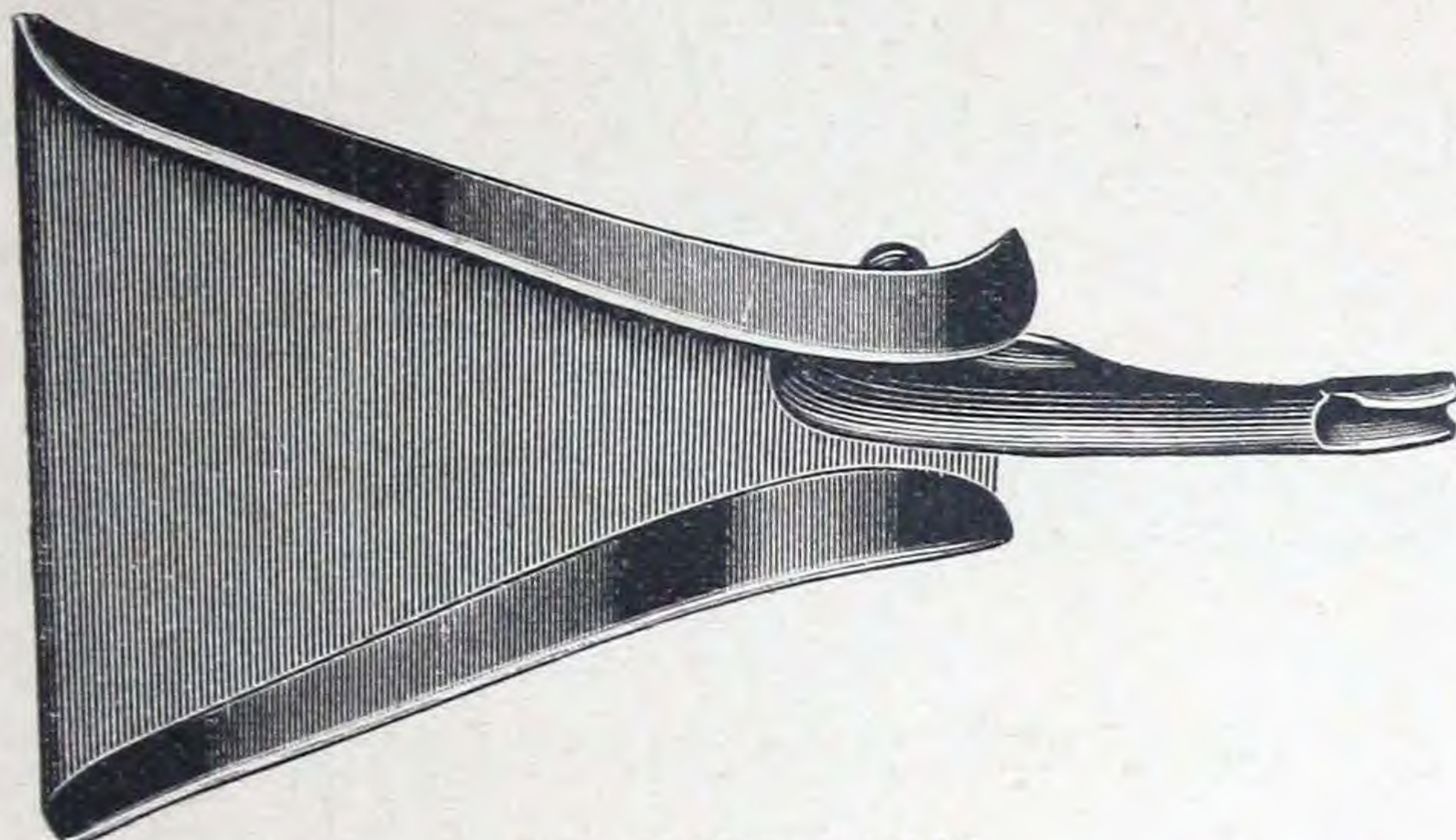
To obtain this result, the trolley wire is kept on a straight line with the lower edge of the switch arm, and as the wheel leaves the arm, the rim of it will run on the pan of the switch without changing its plane. In this way the usual bump in crossing a switch, is entirely avoided. There are no bolts or solder required to hold the trolley wire, and the switch consists of but one casting, which is made of malleable iron well japanned.

This metal has proven to outlast brass many times over, although brass will be used if so specified.

Trade Word.	List No.				Price.
Warbler	5525	Malleable iron, 3-way switch	each		\$3 50
Ward	5526	" " 2 " "	"		3 30
Warder	5527	" " right hand switch	"		3 30
Wardrobe	5528	" " left " "	"		3 30
Warfare	5525 B	Hard brass, 3-way switch	"		6 00
Warhoop	5526 B	" " 2 " "	"		5 50
Warfield	5527 B	" " right hand switch	"		5 50
Warhorse	5528 B	" " left " "	"		5 50



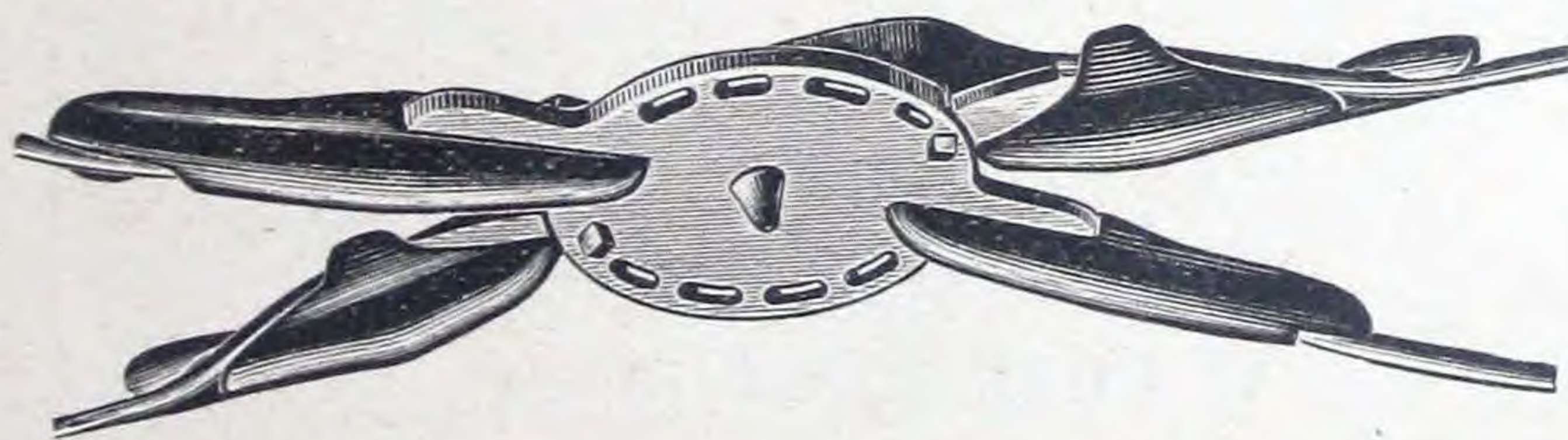
## BADGER LINE MATERIAL.



BRIDGE PAN.

To guide trolley into wire of draw bridges or into car sheds.

Trade Word.	List No.		Price.
Warlike	5530	Malleable iron.....	each \$2 50
Warned	5530 B	Hard brass.....	“ 4 50



ADJUSTABLE CROSS-OVER.

This cross-over can be adjusted to any angle and is very convenient where wires run at sharp angles.

Trade Word.	List No.		Price.
Warproof	5529	Malleable iron.....	each \$3 50
Warrior	5529 B	Brass.....	“ 6 00



BADGER LINE MATERIAL.



SOLDERED TROLLEY EAR.

Trade Word.	List No.			Price.
Watchword	5500	Brass, 15 inch	.....each	\$0 70



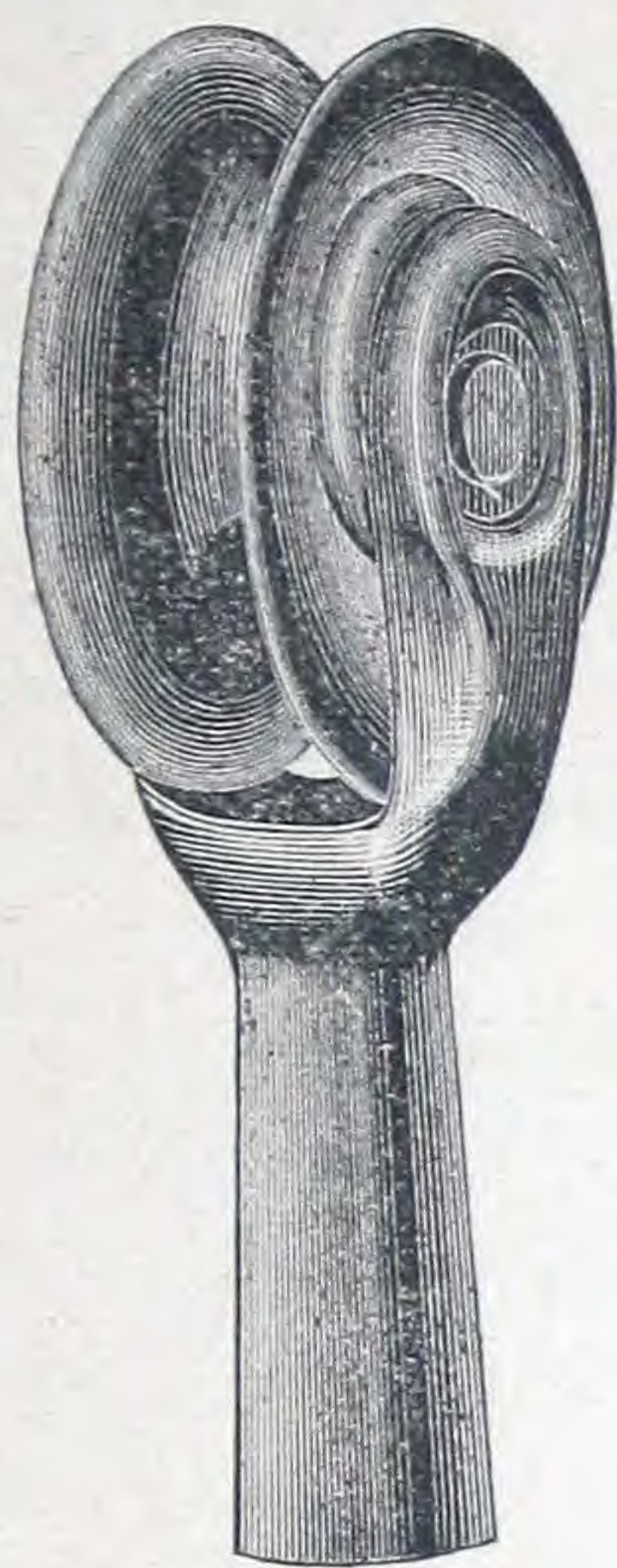
Trade Word.	List No.			Price.
Watchful	5501	Brass, 9 inch	.....each	\$0 60



Trade Word.	List No.			Price.
Watch	5502	Brass, 6 inch	.....each	\$0 50



## BADGER LINE MATERIAL.



### BADGER TROLLEY WHEEL AND FORK.

A ball bearing trolley wheel mounted in a one piece steel fork made by brazing two stamped sheet steel parts together, thus obtaining an extremely strong and light fork, and so formed that no projection or sharp corner can catch in a switch or span wire.

The ball bearing, which for wearing qualities has found no equal, is especially well adapted to a trolley wheel as it offers an extremely large contact area to conduct the current without the use of any springs, or other devices for this purpose. In replacing the wheel, the hardened steel bearing is taken out and inserted into the new wheel and returned to the harp, no adjustment by screws or other means is necessary, and the bearing will last indefinitely.

The only expense in renewing is that of the plain wheel. No oiling is necessary and the bearing is absolutely dust proof.

Trade Word.	List No.	Price.
Wearable	5531	\$6 00



## THE ELECTRIC SOLDERING IRON.

There is always something new under the sun if you can find it. Here it is.

In the construction of the ordinary soldering iron a mass of copper is required that will hold heat for a considerable time, as well as to communicate heat to the article operated upon. With the Electrical Iron this excessive weight is avoided, as the heat is applied **CONSTANTLY** and directly where the work is done; the weight being thus greatly reduced, the iron is handled with less effort.

**COST OF OPERATION.**—The cost of operating the Electric Soldering Iron is affected by the cost of electricity. Where current is furnished from city power stations the cost for each iron will vary from eight to twelve cents per day of eight hours. Where the electricity is supplied from dynamos operated by the shop or factory the cost will be reduced to *a fraction of one cent per iron per day*.

**AVOIDS DANGER.**—In factories where soldering irons are largely employed the present most effective method of heating is with gas or the gasoline blow-torch. The extra fire hazard and increased insurance rate caused by the employment of gasoline is avoided by use of the electrically heated Soldering Iron.

**SAVES INVESTMENT.**—For Irons of a given size the interchangeability of the copper tip in the Tinnerholm Iron saves expense, duplicate Irons not being required. One handle and heating coil may be used for any number of tips of various forms that may be necessary or convenient. These extra coppers are furnished in any desired shape at nominal cost.

**A SUCCESS.**—It has been in practical service in the works of the General Electric Company at Schenectady, N. Y., for over a year, and has therefore demonstrated its practical success. This soldering iron has also been tested by the manufacturers of all kinds of metal goods, and has in all cases proven its reliability and economy.



Trade Word.	List No.	Price.
Weaver	3986	\$12 00



# EXTRACT FROM RULES AND REQUIREMENTS OF THE CHICAGO FIRE DEPARTMENT

For the Insulation of Wiring and Apparatus for Electric Light and Power. By  
PROF. J. P. BARRETT, Superintendent City Telegraph.

## CLASS E.

### ELECTRIC RAILWAYS.

\* \* \* \* \*

36. All rules pertaining to arc light wires and stations shall apply (so far as possible) to street railway power stations and their conductors in connection with them.

#### 37. POWER STATIONS:—

*a.* Must be equipped in each circuit as it leaves the station with an *approved* automatic "breaker," or other device that will immediately cut off the current in case the trolley wires become grounded. This device must be mounted on a fire-proof base, and in full view and reach of the attendant.

#### 38. TROLLEY WIRES:—

*a.* Must be no smaller than No. 0, B. & S. copper or No. 4, B. & S. silicon bronze, and must readily stand the strain put upon them when in use.

*b.* Must be well insulated from their supports, and in case of the side or double pole construction, the supports shall also be insulated from the poles immediately outside of the trolley wire.

*c.* Must be capable of being disconnected at the power house, or of being divided into sections, so that in case of fire on the railway route the current may be shut off from the particular section, and not interfere with the work of the firemen. This rule also applies to *feeders*.

*d.* Must be safely protected against contact with all other conductors.

#### 39. CAR WIRING:—

*a.* Must be always run out of reach of the passengers, and must be insulated with a waterproof insulation.

#### 40. LIGHTING AND POWER FROM RAILWAY WIRES:—

*a.* **Must not be permitted, under any pretense, in the same circuit with trolley wires with a ground return nor shall the same dynamo be used for both purposes, except in street railway cars, electric car houses, and their power stations.**

#### 41. CAR HOUSES:—

Must have special cut-outs located at a proper distance outside, so that all circuits within any car house can be cut out at one point.

#### 42. GROUND RETURN WIRES:—

Where ground return is used it must be so arranged that no difference of potential will exist greater than five volts to 50 feet, or 50 volts to the mile between any two points in the earth or pipes therein.

Adopted January 15, 1894.



## TELEGRAPHIC CODE.

## QUESTIONS AND ANSWERS.

- Aback—At what price can you furnish ——?
- Abacus—Quote us by telegraph.
- Abaft—Quote us by return mail.
- Abandon—Telegraph lowest price and soon can ship.
- Abase—Please give quantities desired.
- Abash—Cannot better quotation.
- Abate—We quote.
- Abatis—We quote for immediate telegraphic acceptance.
- Abduct—We quote in response to your inquiry of ——
- Abhor—We cannot accept at the price.
- Abide—We will accept your order.
- Abject—We will accept your order and make immediate shipment.
- Abjure—We do not make the article desired.
- Able—Can you ship immediately?
- Abluton—Can you ship in ——?
- Ably—Have you in stock?
- Aboard—Have you in stock? If not, how soon can you ship?
- Abode—How soon can you ship?
- Abolish—How soon can you make first shipment and how fast remainder?
- Absolute—How much can you ship at once?
- Absorb—Can you ship at once from stock if advised immediately?
- Abstract—Can ship at once on receipt of order.

## LETTERS AND TELEGRAMS.

- Babble—Answer by mail.
- Baby—Referring to our letter of ——
- Back—Referring to your letter of ——
- Badge—We write you fully today.
- Baffle—We have no letter from you.
- Bag—Will write you fully in a day or so.
- Bail—Write, giving full particulars.
- Bake—See our letter of today giving full particulars.
- Balance—Answer by telegraph.
- Balcony—Referring to our telegram of ——
- Bald—Referring to your telegram of ——
- Balloon—Telegraph by night message.
- Ballot—Telegraph immediately.
- Band—Telegraph reply as soon as possible.
- Banner—We have no telegram from you.
- Baptist—Why do you not telegraph?
- Barber—Why do you not telegraph answer to inquiry of ——?
- Bargin—Can ship in ——
- Barley—Can begin shipping at once and complete in ——
- Barn—Can ship within one week from receipt of order if advised at once.
- Barrel—Can ship within two weeks from receipt of order if advised at once.
- Basket—Have none in stock.



## TELEGRAPHIC CODE—Continued.

## ORDERS.

- Cab—Add to our order of —  
Cable—Change our order of —  
Cadet—Hurry forward goods on our order of —  
Calendar—Have you shipped goods on our order? If not, when will you?  
Calf—Enter order if you can ship in —  
Camel—Hold for instructions our order of —  
Camp—Instructions by mail.  
Canal—Prepay freight.  
Cancer—Shipping instructions will be sent you.  
Candle—Ship immediately.  
Candy—Ship as soon as possible.  
Cargo—Ship by American Express.  
Carvel—Ship by United States Express.  
Cartoon—Ship by Wells, Fargo & Co.  
Carp—Ship Adams Express.  
Care—Ship by express.  
Church—Ship by fast freight.  
Circle—Ship quickest route.  
Claim—Ship cheapest route.  
Clear—Send tracer immediately for shipment of —  
Cliff—Wait receipt of letter before proceeding with order.  
Clog—First shipment will be made —  
Club—If you cannot ship in time named advise by telegraph.  
Clutch—Have entered order and will ship.  
Coal—Have sent tracer as requested.  
Colony—Too late to cancel order.  
Color—We ship you today.  
Coop—We expect to ship.  
Copy—We will complete your order.  
Cotton—We will ship.  
Count—We have shipped.  
Coward—We have completed your order.  
Cradle—We have entered order.  
Cramp—Telegraph shipping instructions for your order of —

## SHIPPING DIRECTIONS.

- Dongola—Ship via C. & N. W. R. R.  
Domino—Ship via C. M. & St. P. R. R.  
Domine—Ship via Illinois Central.  
Dalphin—Ship via C. R. I. & P.  
Domestic—Ship via Wabash.  
Doquet—Ship via Big Four.  
Doric—Ship via C. & W. Mich.  
Doxology—Ship via A., T. & S. F.  
Dragoon—Ship via B. & O.  
Dramatic—Ship via C. B. & Q.  
Dramatize—Ship via Chicago Gt. Western.  
Drudge—Ship via C. & A.



## TELEGRAPHIC CODE—Continued.

Drummer—Ship via C. & E. Ill.  
 Drum—Ship via C. & Erie.  
 Drunk—Ship via C. & Gd. Trunk.  
 Ducat—Ship via C., C., C. & St. Louis.  
 Dudgeon—Ship via Goodrich Line.  
 Duke—Ship via Graham & Morton Line.  
 Dusty—Ship via L. M. & L. S. Trans. Co.  
 Dutch—Ship via L. S. & M. S.  
 Duty—Ship via L., N. A. & Chicago.  
 Dwarf—Ship via Michigan Central.  
 Dwell—Ship via N. Y., Chicago & St. Louis.  
 Dwindle—Ship via North Mich. Line.  
 Dyke—Ship via Pittsburg, C., C. & St. L.  
 Dynamic—Ship via Pennsylvania Co.  
 Dynasty—Ship via Wisconsin Central.

Code Word.	No. in Feet.	Code Word.	No. in Feet.	Code Word.	No. in Feet.
Edgar .....	25	Erastus .....	650	Esther .....	5000
Edmund .....	50	Eric .....	700	Ethel .....	6000
Edward .....	100	Ernest .....	750	Eva .....	7000
Edwin .....	125	Ethan .....	800	Felix .....	8000
Egbert .....	150	Eugene .....	850	Ferdinand .....	9000
Elbert .....	200	Evan .....	900	Fernando .....	10000
Eldret .....	225	Ezra .....	950	Francis .....	15000
Eli .....	275	Edith .....	1000	Frank .....	20000
Eliah .....	300	Edna .....	1500	Frederic .....	25000
Elias .....	350	Eleanor .....	2000	Fanny .....	30000
Elijah .....	400	Eliza .....	2500	Florence .....	35000
Elmer .....	450	Ellen .....	3000	Francisco .....	40000
Emery .....	500	Emeline .....	3500	Gabriel .....	50000
Enoch .....	550	Emily .....	4000		
Enos .....	600	Emma .....	4500		

Code Word.	Amount in Pounds.	Code Word.	Amount in Pounds.	Code Word.	Amount in Pounds.
Garret .....	1	Given .....	7	Guy .....	30
George .....	2	Goddard .....	8	Geraldine .....	35
Gerald .....	3	Godfrey .....	9	Gertrude .....	40
Gideon .....	4	Gregory .....	10	Harold .....	45
Gilbert .....	5	Griffith .....	20	Henry .....	50
Giles .....	6	Gustavus .....	25	William .....	100

Code Word.	Quantity in Gross.	Code Word.	Quantity in Gross.	Code Word.	Quantity in Gross.
Herbert .....	1	Howell .....	5	Hannah .....	9
Herman .....	2	Hubert .....	6	Helen .....	10
Hiram .....	3	Hugh .....	7	Hester .....	15
Horace .....	4	Hugo .....	8		

Code Word.	Quantity.	Code Word.	Quantity.
Ingram—Twice the quantity ordered.		Isaiah—Four times the quantity ordered.	
Isaac—Three times the quantity ordered.		Israel—Five times the quantity ordered.	



# TELEGRAPHIC CODE—Continued.

## NUMBER CODE.

Code Word.	No.	Code Word.	No.	Code Word.	No.
Aaron .....	1	Bertram .....	45	Celestine .....	3500
Abel .....	2	Barbara .....	50	Celia .....	4000
Abner .....	3	Beatrice .....	60	Charity .....	4500
Abraham .....	4	Bertha .....	75	Charlotte .....	5000
Adam .....	5	Betsey .....	100	Clara .....	6000
Albert .....	6	Blanche .....	125	Clarice .....	7000
Albion .....	7	Bridget .....	150	Clarissa .....	8000
Alexander .....	8	Caleb .....	175	Claudia .....	9000
Alfred .....	9	Calvin .....	200	Constance .....	10000
Alonzo .....	10	Cecil .....	250	Cora .....	15000
Alvan .....	11	Charles .....	300	Corinna .....	20000
Ambrose .....	12	Christian .....	350	Cornelia .....	25000
Amos .....	13	Christopher .....	400	Dan .....	30000
Andrew .....	14	Clarence .....	500	Daniel .....	35000
Anthony .....	15	Claude .....	600	Darius .....	40000
Archi .....	16	Clement .....	700	David .....	45000
Arthur .....	17	Conrad .....	800	Denis .....	50000
Austin .....	18	Constant .....	900	Derrick .....	55000
Barnabas .....	19	Cornelius .....	1000	Donald .....	60000
Barnaby .....	20	Cyril .....	1500	Duncan .....	75000
Benedict .....	25	Cyrus .....	2000	Deborah .....	100000
Benjamin .....	30	Caroline .....	2500		
Bernard .....	35	Catharine .....	3000		

N. I. R. RUBBER  
COVERED WIRE

SIGNAL CROSSING S. & R.

"M  
USE A TAPE  
C"

BADGER LINE MATERIAL

L  
A  
M  
METROPOLITAN  
S

P. & B. COMPOUND

WEATHERPROOF I. X. L.



## ALPHABETICAL INDEX.

A.	Page.
Adjustable Strain Ear.....	30
“ Switches.....	31
“ Cross-over.....	31-33, 181
“ Pole Bracket.....	116-117
Alphabetical Index.....	190-193
Ammeter, Weston.....	165
Amidons Corner Brace.....	57
Anchor Plates.....	29
Angular and Ratchet Drilling Machines.....	79
Arc Light Rope.....	18
“ Lamps.....	154-155-156
“ Lamp Hangers.....	158
“ “ Spark Arrester.....	158
Armatures.....	47
Armature Cores.....	46
“ Bellows.....	70
“ Bearings.....	45
“ Twine.....	104
Augers, Post Hole.....	67
Automatic Crossing Signal.....	75-76
Axle Bearings.....	45

B.	Page.
Badges.....	149
Badger Adjustable Cross-over.....	181
“ Bridge Pan.....	181
“ Circuit Breaker.....	178
“ Line Material.....	177-182
“ Sleeve.....	179
“ Soldered Trolley Ear.....	182
“ Switches.....	180
“ Trolley Hanger.....	179
Ball Clusters.....	96
Bare Copper Wire.....	12
Bearings.....	45
Bell Clusters.....	96
“ Cord.....	105
“ “ Couplings.....	105
Bellows.....	70
Blow Pipe or Torch.....	74
Bolt Cutting Machine.....	79
Bolts.....	122-123
Books.....	167-168
Brace Drill.....	57
“ Amidon's Corner.....	57
Bracket, Comb. Pole.....	117
“ Pole Adjustable.....	116
“ Iron.....	126
“ Wood.....	128
“ Hanger.....	22
Brake Handle, Ratchet.....	41
Bridge and Barn Insulators.....	23
Brooms, Steel.....	146
Brush, Copper.....	19
“ Snips Commutator.....	70
“ Dynamo.....	101-102
Bryant Switches.....	95
“ 500 V. Cut-Out.....	90

C.	Page.
Cant Hooks.....	67
Caps, Rail Bonds.....	50
Car Checks.....	149
Carriage Bolts.....	123
Carrier, Wire.....	35
Carrying Hooks.....	67
Ceiling Fans.....	161
Champion Screw Drivers.....	66
Channel Pins.....	50
Chicago Arc Light Spark Arrester.....	166
Circuit Breaker, Badger.....	28
“ “ Knox.....	20
“ “ .....	133
“ “ P. & S. ....	138
“ Loop Break.....	138
Clamp, Trolley.....	25-26-27, 178-179
“ Feeder.....	28
“ Splicing.....	61
“ Klein's and Haven's.....	62
Clark's Pulley Blocks.....	82
Cleveland Arc Cut-Out.....	159
Climbers, Eastern and Western.....	69
Coach or Lag Screws.....	124
Compound Eccentric Clamps.....	58-62
“ Insulating P. and B.....	5
“ Chatterton's.....	103
Commutator, Conserver.....	19
“ Brush Snips.....	70
“ Ends.....	45
Combination Pole Bracket.....	117
Common Pay-Out Reel.....	68
Combination Plug Arc Switch Board.....	80
“ Pay-Out Reels.....	68
Come-Along Eccentrics.....	59
Construction Tools.....	56
Connectors, Trailer.....	48
“ or Splicing Clamps.....	61
Cord, Bell.....	105
Cores, Motor and Generator Armature.....	46
Corner Pins.....	128
Cotton Waste.....	104
Couplings, Bell Cord.....	105
Crocus Cloth.....	104
Cross Arms.....	119-120
“ Long Leaf Georgia Pine.....	120
“ Arm Braces.....	121
Cross Connecting Copper Bonds.....	50
Crossing Signal, S. & R.....	75-76
Cross-Over.....	31-33
Cross-Over, Badger.....	181
Crow Bars.....	67
Cut-Outs, Cleveland Arc.....	159
“ Power's Arc.....	159
“ Bryant 500 Volt.....	90

D.	Page.
Diagonal Pliers.....	64
Digging Bars.....	67



	Page.		Page.
Drill, Hand.....	57	Hanger Pipe Bracket.....	22
“ Brace.....	57	“ Straight Line.....	25, 179
“ The Schuttler Ratchet.....	77-78	Havens Clamps.....	62
Drilling Machines.....	79	Headlights.....	151-152-153
Dynamo Brushes.....	101-102	Headlight Sockets.....	152
		Headlight Switches.....	48
<b>E.</b>		Hercules Trolley Clamp.....	26
Ear, Badger Trolley.....	182	Hexagon Nuts.....	125
“ Soldered Trolley Wire.....	29	Hill's Telescoping Iron Tower wagon.....	106-109
“ Feeder.....	29	Holder Wire.....	35
“ Adjustable Strain.....	30	“ Fuse.....	89
“ Strain.....	30		
“ Splicing.....	30	<b>I.</b>	
Eastern Climbers.....	69	Incandescent Lamps.....	157
Eccentric, Come-Along.....	59	Incandescent Lamp Cord.....	12
“ Klein's.....	58	Index, Alphabetical.....	190-193
Eichberg Tree Insulator.....	137	“ List Numbers.....	201-204
Electric Headlights.....	151, 152, 153	“ Trade Word.....	194-200
Electrician Scissors.....	63	Insulated Turn Buckles.....	127
Electric Soldering Iron.....	184	Insulating Paper, P. & B.....	7
Emery Cloth.....	104	“ Oil Paper.....	104
End-Cutting Nippers.....	64	“ Iron Line Wire.....	17
Eureka Post Hole Digger.....	56	Insulators, Bridge and Barn.....	23
Excelsior Soldering Copper.....	73	“ Strain.....	32-138
Extract from Rules and Regulations, etc.,		“ Wooden Strain.....	32
Barrett.....	185	“ Feeder Wire.....	34-37
Eye Bolts.....	121-127	“ Glass.....	129-134
		“ Porcelain.....	135-136
<b>F.</b>		Intermediate Bearings.....	45
Fans, Dayton Ceiling.....	161	Iron Poles.....	110-115
“ Desk and Bracket.....	162	“ Brackets.....	126
Feeder Clamp.....	28		
“ Ear.....	29	<b>J.</b>	
“ Yoke.....	33	Jack Knife Switches.....	85-88
“ Wire Splicer.....	38		
Feed Wire Insulators.....	34-37	<b>K.</b>	
Fender, Patent Automatic Pick-Up.....	142-145	Kester Arc Lamp.....	154-155-156
Fibre Sheet.....	105	Knox Circuit Breaker.....	20
Fletcher Gem Wire Holders.....	36	Knife, Novelty Pocket.....	66
“ Feed Wire Insulators.....	37	Knife Switches.....	85-88
“ Arc Lamp Holder.....	158		
“ Tree Wire Holder.....	38	<b>L.</b>	
Fuse Wire.....	15	Lag Screws.....	121-124
“ Block.....	99	Lag Screw Wrench.....	70-71
“ Holder.....	89	Lamp Cord.....	12
		Lamps, Railway Incandescent.....	157
<b>G.</b>		Lead Covered Wire.....	13-14
Garton Lightning Arrester.....	97-98	Lightning Arresters, Garton.....	97-98
Gears, Steel and Iron.....	42-43-44	“ “ Walker.....	99
Gem Wire Holders.....	36	Linemen's Tool Bag.....	65
Gibbs Trolley.....	51	Line Wire, Weatherproof.....	17
“ “ Parts.....	52		
Gloves, Rubber.....	65	<b>M.</b>	
Glass Insulators.....	129-134	Machine Bolts.....	122
Gongs.....	141	“ Mac ” Tape.....	13-14
Guard Wire, Susp. Ins.....	37	Magnet Wire.....	16
“ Arms.....	127	Magneto Testing Bells.....	164
Guy Wire.....	18	M. E. Strain Insulator.....	138
		Mica, Uncut Sheet.....	104
<b>H.</b>		Motor Cloth, P. & B.....	8
Hall's Vises.....	60	“ and Generator Armature Core.....	46
Hand Drill.....	57	“ “ Armatures.....	47
“ Telephones.....	163		



N.	Page.		Page.
Nippers, End Cutting	64	Rope, Arc Light	18
Novelty Pocket Knife	66	" Pure Manilla	103
Novelty Screw Driver	66	" Trolley	105
Number Code	189	Royal Transformer	160
Nuts	125	Rubber Covered Wire	10-11
		Rubber Gloves	65
O.		S.	
Oil Paper	104	S. & R. Crossing Signal	75-76
P.		Schuttler Ratchet Drill	77
P. & B. Compound	5	" " " Parts	78
" Paint	5	Scissors, Electrician	63
" Armature Varnish	6	Screw Driver, Novelty	66
" Insulating Tape	6	" " Champion	66
" Motor Cloth	8	" " Vulcan Insulated	66
" Giant Ins. Paper	7	Screws, Lag or Coach	124
P. & S. Circuit Breaker	138	Sheet Mica	104
Paper, Insulating Oil	104	Sheet Fibre	105
Paragon Speed Indicator	100	Shovels	56
Pick Axe	27	Side Cutting Pliers	63
Pick-Up Fenders	142-145	Silver Plated Mirror Reflectors	150
Pike Poles	68	Sleeve, Badger	179
Pins Channel	50	Sockets, Waterproof	91
" Oak, Locust and Corner	128	" Temporary	91
Pipe Bracket Hanger	22	" Metropolitan	92-93
Pliers, Diagonal and End Cutting	64	" Headlight	152
" Side Cutting	63	" Temporary	91
Plug Switches	89	Solder	103
Pole Ratchets	40	Soldered Trolley Ear, Badger	182
" Supporters	69	Soldered Trolley Ear	29
" Brackets	116-117	Soldering Coppers	73
" Steps	121	" " and Iron	73
Poles, Iron	110-115	" Furnaces	74
" Wood, Octagonal	118	" Iron	184
" " Common	119	" Stoves	74
Porcelain Insulators	135 136	" Salts	103
Post Hole Diggers, "Eureka"	56	Solder Ladle	73
" " Augers	67	Span Wire	17
Powers Arc Cut-Out	159	Speaking Tube Sets	163
Pruning Saw and Knife	59	Speed Indicator, Common	100
Pull-Overs	21-23-24-28	" " Paragon	100
Pulley Blocks	72	Splicing Ear	30
" " Ecc. Clamp Combined	72	" Tube and Threading Tool	39
" " Weston Geared	81	Splicer, Threaded Trolley	39
" " " Direct	81	" Feed Wire	38
" " Clark's	82	Splicing Clamps or Connectors	61
Punches, Ticket	147-148	Spoons	56
R.		Spring Brass Wire	19
Rail Bonds	49-50	Square Nuts	125
" " Caps	50	Star Power Saw	79
Railway Motor and Generator Armatures	47	Standard Stoves	139-140
Raising Forks	67	Straight Line Hanger	25
Ratchet, Self-Locking Pole	40	Strain Ear	30
" Insulated	40	Strain Insulator, M. E.	32-138
" Bracket Handle	41	Stranded Wire	11-14
Receptacle Special Concealed	90	Street Car Fixtures	150
Receptacles, Porcelain Wall	91	Stub's Vises	60
Reels, Take-Up	69	Suspension Insulator, Guard Wire	37
" Pay-Out	68	Switch Board Cable	11
Reflectors, Mirror	150	" " Telephone	163
		Switches, Adjustable	31
		" Badger	180
		" Bryant	95



	Page.
Switches, Board Combination Plug Arc	80
“ Headlight	48
“ Knife	85-88
“ Plug	89
“ Sweet’s Automatic Limit	83-84
“ “Xntric”	94
Swivel Tree Insulator	137

T.

Tables	168-176
Tackle Blocks	72
Take-Up Reel	69
Tamping Bars	67
Tape, "Mac"	13-14
"    " P. & B."	6
Telegraph Code	186-187-188
Telephone and Telegraph Wire	18
"    Transmitters	163
Telephones	163
Temporary Sockets	91
Testing Bells	164
Thomson-Houston Wire Brushes	101
Three Light Electroliers	150
Threaded Trolley Splicer	39
Ticket Punches	155
Tie Wrench	59
Tool Bag	65
"    Belt	65
Tools, Construction	56
Tower Wagon	106-109
Track Brooms	146
"    Drill	77-78
Trailer Connectors	48
Transformers	160
Tree Insulator, Eichberg	137
"    Wire Holders	38
Trolley Clamp	25-26-27
"    Ear, Badger	182
"    Ears	29
"    Hanger, Badger	179
"    Harps	51-53-54-55
"    Parts Gibbs	52
"    Rope	105
"    The Gibbs	51
"    Wheels	52-53-54
"    Wire	12
"    "    Splicer	39, 179
Turn Buckles	127
Twine Armature	104

U.	Page.
Uncut Sheet Mica.....	104
Underground Cable.....	13-14

## V.

Varnish, Armature and Field Coil, P. & B.	6
Victor Split Insulator	138
Vises, Stub's Linemen's	60
Vises, Hall's	60
Volt Meter	166
Vulcan Insulated Screw Driver	66

## W.

Walker Lightning Arrester.....	99
Wall Receptacles.....	91
Washers.....	125
Waste Cotton.....	104
Waterproof Sockets.....	91
Western Climbers.....	69
Weston Standard Ammeter.....	165
"        "        Volt Meter.....	166
Wheel Guard and Pick-Up Fenders.....	142-145
Wiremen's Tool Belts.....	65
Wire, Bare Copper.....	12
"    Carrier.....	35
"    Fuse.....	15
"    Gauze Brushes.....	101
"    Guy.....	18
"    Holder.....	35-36
"    Insulated Iron Line.....	17
"    Lead Covered.....	13
"    Magnet.....	16
"    Rubber Covered Solid.....	10
"        "        "        Stranded.....	11
"    Span.....	17
"    Spring Brass.....	19
"    Trolley.....	12
"    Weatherproof.....	10
Wirt Dynamo Brush.....	102
Wood Tackle Blocks.....	72
Wrench Lag Screw.....	70-71
"    Tie.....	59
"    Splicing.....	61

X.

"Xntric" Switches .....	94
-------------------------	----

 $\gamma$ 

Yoke, Feeder.....	33
-------------------	----



# INDEX TO TRADE WORDS.

[illegible]



[illegible]



Trade Word.	Page.	Trade Word.	Page.	Trade Word.	Page.	Trade Word.	Page.
Nominator	16	Poker	18	Prejudice	29	Project	37
Nopal		Poking		Prelate		Projected	
Norium		Polar		Prelation		Promoting	
Normal		Polder		Prelature		Prone	
Norse		Polecat		Prelaty		Prong	
Nosegay		Polemic		Prenunciation		Pronoun	38
Nosle		Police		Preordain	30	Pronounce	
Notion		Policy		Prepose		Prop	
Notional		Polish		Prescribe		Propel	
Notorious		Politic		Presented	31	Propeller	39
Nourish		Polka		President		Propelled	
Novel		Pollack		Presidential		Propense	
Novelty		Pollard				Property	
Novice		Pollen					
Noxious		Poller		Prest	32	Prophecy	40
Nucleus		Pompous		Prest		Prophet	
Nude		Pond		Prestige		Propound	
Nudge		Ponder		Presto		Propounding	
Nudity		Pondering					
Nugation	17	Ponderous	19	Presume	33	Propped	41
Nugatory		Ponent		Presuming		Prosaic	
Numb		Pongo		Presumption			
Numeric		Ponk		Pretence	34	Prosalist	42
Numerical		Pontiff				Proscribe	
Numerist		Pontoon		Pretend	35	Prose	
Numerous		Poodle		Pretender		Prosecute	43
Numps		Poplar		Pretending		Proser	
Numskull		Poppy		Pretext		Prosing	
Nun		Popular		Pretty		Prosodist	
Nuncia		Populate		Prevail		Prosody	44
Nuptial		Populated		Prevailing	36	Prosper	
Nurse		Populous		Prevaricate		Prosperous	
Nursery		Porcate		Prevene		Prostate	
Nursling		Porcupine		Prevent		Protector	45
Nutgall.		Porite		Pride		Protege	
Nuzzle		Porous		Primero	37	Protend	
Nymph		Porpoise		Primitive		Protended	
Nympish		Porret		Primrose		Protense	
Nymphean		Port		Prisage		Protest	
Nymphia		Portal		Prison	38	Protested	46
		Portico		Prisoner		Proteus	
		Portion		Privacy		Prothesis	
		Portrait		Privado		Protocal	
		Portray		Private		Protopope	
		Portlast	20	Privateer	39	Protoplast	47
		Portoise		Privation		Protosalt	
		Poser		Privilege		Prototype	
		Pose		Probang			
		Possum		Probate	40	Protract	48
		Postage	21	Probation		Protracted	
		Posterior		Probationer		Protrude	
		Postern		Probative		Protruding	
				Probator		Protrusion	
		Postfix	20	Probe	41	Protrusive	49
		Postique	22	Probit		Proud	
		Posture		Problem		Prouder	
		Potager				Proudest	
		Potassa		Proboscis	42	Proudly	
		Potassium	23	Procacious		Provable	50
		Potato		Procacity		Provably	
		Potentate		Procedure		Prove	
		Pothecary		Proceeding		Proven	
				Process	43	Provender	51
		Pouch	24	Proclaim		Proverb	
		Poultry		Proclive		Provide	
		Precept		Proctor		Providence	
		Preceptor		Prodigal		Provider	
		Precession	25	Prodigious	44	Province	52
		Precinct		Prodigy		Provincial	
				Prodrome		Provine	
		Precious		Product			
		Precipice		Proface	45	Provision	53
				Profane		Proviso	
		Precise	26	Profaner		Provisor	
		Precisive	27	Professor		Provisory	
			28	Proffer		Provoke	54
		Predial		Profile	46	Provoking	
		Predicate		Profusion		Provost	
		Predict		Prognosis		Prow	
				Progress		Prowled	
				Prohibit		Prowess	



Trade Word.	Page.	Trade Word.	Page.	Trade Word.	Page.	Trade Word.	Page.
Prowl	45	Pullet	50	Puranic	70	Radiant	58
Prowler		Pulicat		Purely		Radiary	
Prowling		Pulmonary		Pureness	63	Radiata	
Proxene		Pulmonic		Purfile		Radiate	62
Proximate		Pulp		Purgament		Radiating	
Proxime		Pulpatoon		Purgative		Radiation	
Proximity		Pulpit		Purgatory		Radical	69
Proxy		Pulpous		Purge	64	Radicalism	
Prude		Pulsate		Purging		Radically	
Prudence		Pulsation		Purifier		Radican	68
Prudent		Pulsatory		Purist		Radiation	
Prudently		Pulse		Puritan		Radicalism	
Prudish		Pulsific		Puritanic	65	Radiolites	67
Prudish		Pulison		Puritanical		Radiometer	
Pruina		Pulverate		Puritanism		Radish	
Prune		Pulverize		Puritanize		Radius	61
Prunella		Pulverous		Purity		Radix	
Prunello		Pulvil		Purl	74	Raff	
Pruner		Puma		Purlieu		Raffle	66
Pruning		Pumicate	52	Purling		Raffling	
Prurient		Pumicated		Purloin	66	Raft	67
Prurigo		Pumicating		Purpled		Rafter	
Prussian		Pumice		Purple		Rafted	61
Prussiate		Pumiceous		Purport		Raftered	
Prussic		Pummel		Purpose	71	Rafty	
Psalm		Pump		Purpuric		Rafting	81
Psalmody		Pumper		Purse		Rag	
Psalmolist		Pumpion		Pursuant		Rage	82
Psalmodic	46	Pumpkin		Pursue	66	Ragged	
Psalter		Pumy		Purvey		Ragout	77
Psammite		Punch		Purveyance		Ragwort	
Psammitic		Punched		Purveying	72	Raid	78
Pseudo		Punching		Purveyor		Rail	
Psoas		Punchy		Purview		Railing	82
Pubes		Punctate		Purveyed		Raillery	
Public		Punctiform		Push	72	Raiment	
Publican		Punctilio		Pushing		Rain	79
Publication		Punction		Putrid		Rainbow	
Publicist		Puncto		Putridness	72	Rainbeat	77
Publicly		Punctual		Putting		Raindeer	
Publicness		Punctuate		Puttock		Raise	78
Publish		Punctuation		Putty		Rajah	
Published		Punctuist		Puzzle	72	Rake	
Publishing	47	Puncture		Puzzling		Raker	77
Publishment		Pundit		Pyramid		Raking	
Puccoon		Pungency	53	Pyrotic	72	Rakish	82
Pucelage		Pungent		Pyroxene		Ralliance	
Puceron		Punic		Python		Rallied	77
Puck		Punniness		R.	72	Rally	
Pucker		Punish		Rabate		Rallying	78
Pudder		Punishable		Rabato		Ram	
Pudding		Punished		Rabbit		Ramadan	79
Puddle		Punisher		Rabbing		Ramage	
Puddling		Punishing		Rabbinism		Ramble	78
Pudency		Punishment		Rabble		Rambler	
Pudenda		Punition		Rabinist		Rambling	77
Pudic		Punitive		Rabid		Rambooze	
Puerile		Punitory		Raceme		Ramekin	78
Puff	48	Punk		Racer		Rameous	
Puffer		Punka		Rack		Ramified	79
Puffing		Punner		Racket		Ramify	
Puffy		Punster	57	Racking		Rammed	78
Pug		Punter		Racy		Rammer	
Pugfaced		Puny		Rad	59	Rammish	77
Pugging		Pupil		Raddle		Ramming	
Pugh		Pupilage		Raddock		Rammy	79
Pugil		Pupillary		Radial		Ramous	
Pugilism		Puppet		Radiance		Ramp	78
Pugilist		Puppetry				Rampage	
Pugilistic		Puppy				Rampallian	
Pugnacious		Pup	70			Rampart	79
Pugnacity		Pupilate				Rampier	
Pull		Pupilageing				Rampion	79
Pullback		Puppyism				Rampire	
Pulled		Purana					
Pulley	50						
Pullen							
Puller							



Trade Word.	Page.	Trade Word.	Page.	Trade Word.	Page.	Trade Word.	Page.
Rampired	79	Reach	86	Rechoose	88	Redispose	94
Ramrod		Reached		Recipient		Redisposing	
Ramson	80	Reaching		Reciprocal		Redoubt	95
Ranculous	84	React		Recision		Redound	
Rancescent		Reacting		Recital		Redress	
Ranch		Reaction		Recited		Redriven	
Ranchero		Reactive		Reciting		Redtop	
Rancid		Readable		Reckon		Reduced	
Rancidity		Reading		Reckoning		Reducent	96
Rancor		Readjourn		Reclaim		Reduct	
Rancorous		Readjust		Reclaimed		Reduction	
Rand		Readmit		Recline		Reecho	
Random		Readorn		Reclining		Reedy	
Randy		Reaffirm		Reclude		Reef	
Range		Reagent		Recluse		Reefband	97
Ranforce		Realgar		Reclusion		Reefing	
Ranger		Realism		Reclose		Reek	
Ranging		Realist		Recoast		Reeking	
Rank		Reality		Recoct		Reel	
Rankle		Realize		Recognize	88	Reelect	98
Rankling		Ream		Recognizor		Reelected	
Rankness		Reap		Recoil		Reembark	
Ransack		Reaping		Recoiling		Reembody	
Ransom		Reapply		Recoin		Reemerge	
Ransomer		Reappoint		Recoinage	89	Reeming	99
Ransoming		Rear		Recoining		Reenact	
Rant		Rearing		Recollect		Reenacted	
Ranterism		Reascend		Recombine		Reenforce	
Rantipole		Reason		Recomfort		Reengage	100
Rapacious		Reasonable		Recommit		Reenjoy	
Rapacity		Reasoned		Recompact		Reenlist	
Raphe		Reassert		Recompose		Reenlisted	101
Rapid		Reassign	87	Reconcile	91	Reenlistment	
Rapidity		Reassume		Reconquer		Reexport	
Rapidness		Reassure		Record		Refashion	
Rapillo		Reassured		Recorder		Refect	
Raprier		Reassurer		Recording		Refectory	
Rapparee	85	Reasty		Recouch	92	Referable	102
Rapper		Reate		Recount		Referee	
Rapport		Reattach		Recoured		Reference	
Rapt		Reattempt		Recourse		Referment	
Raptor		Rebate		Recover	94	Referred	103
Raptorious		Rebato		Recoveror		Refind	
Rarity		Rebec		Recreate		Refinery	
Rascal		Rebel		Recreated		Refinement	
Rascally		Rebelled		Recrement		Refining	
Rashed		Rebellion		Recross	95	Refit	104
Ratafia		Rebellow		Recrossing		Reflect	
Ratan		Reblossom		Recruit		Reflected	
Ratch		Reboation		Recruiting		Reflectent	
Ratchet		Reboil		Rectangle		Reflex	
Ration		Rebound		Rectify	96	Refloat	105
Rational		Rebrace		Rectitude		Reflow	
Rationalist		Rebuff		Rector		Reflux	
Ratline		Rebuild		Rectorate		Refoment	
Ratoon		Rebuke		Rectrix		Reform	106
Rattle		Rebukeful		Recumb	97	Reformed	
Rattlebox		Reburer		Recumbent		Reformer	
Raucity		Rebury		Recur		Reforming	
Raucous		Rebus		Recurve		Reformist	
Raught	86	Rebutted	88	Recuse	98	Refossion	107
Ravage		Recall		Redact		Refound	
Ravaging		Recalling		Redan		Refounding	
Ravager		Recant		Redargue		Refract	
Rave		Recanted		Redden	99	Refraction	
Ravel		Recanting		Reddle		Refractive	
Ravelin		Recaption		Redeemed		Refrain	108
Raven		Recaptor		Redeeming		Refraining	
Ravening		Recast		Redeliver	100	Reframed	
Ravenous		Recede		Redemand		Refresh	
Raver		Receding		Redemise		Refreshed	
Ravine		Receptor		Redescend		Refreshing	
Ravish		Recency		Redient	101	Refret	109
Rawhide		Reception		Redigest		Refugee	
Rawish		Receptory				Refurbish	
Rawness		Recess					
Razee		Rechange					
Razeeing		Recharge					
Reabsorb		Recharter					
Reaccess		Recheat					



Trade Word.	Page.	Trade Word.	Page.	Trade Word.	Page.	Trade Word.	Page.
Refusal	103	Relenting		Repertory	137	Saltation	165
Refusing		Relevance		Reprecussion		Saltatory	
Refutable		Reliance		Repetend		Saltern	
Refusal		Relic		Replait		Saltigrade	
Refute		Relieved	121	Replead	138	Saltiness	
Regain		Relight		Replenish		Salubrious	
Regal	104	Religion		Replete		Salubrity	166
Regale		Religious		Replevin		Salute	
Regalia		Relinquent		Reposit	140	Salutation	
Regaling		Relinquish		Reprieve		Salutory	
Regarding		Reliquary		Reprimand		Salvable	
Regarding		Relique		Reprisal		Salvage	
Regardful		Relish		Reproduce		Salvation	144
Regatta		Reloan		Reproof		Salvatory	
Regency		Reluct		Reprove	141	Salve	
Regent		Reluctant		Reproved		Salver	
Regest	105	Reluctate	126	Reprune		Salvo	150
Regible		Relume		Reptile		Sambo	
Regicide		Remade		Republic		Sanable	
Regiment		Remain		Republican		Sanation	
Region	110	Remand		Republish		Sanative	
Register	111	Remanent		Repudiate		Sanctify	151
Registry	112	Remark		Repugn	146	Sanction	
Reglet	113	Remarkable		Repugnant		Sanctum	164
Regnant	114	Remarked		Repulse		Sanctitude	
Regraft	115	Remarker		Reputable	67	Sandal	
Regrant	116	Remarried		Repute		Sandarac	
Regrate		Remast		Requisite		Sandever	
Regreet	117	Remble		Requital		Sandiness	
Regress		Remdial		Resind		Sandish	164
Reret	118	Remediate	127	S.		Sandwich	
Regular		Remedy		Sabbatic		Sanguify	
Regulate		Remelt		Sabbatism		Sanhedrum	
Reguline		Rememorate		Saber	146	Sanitary	
Regulize		Remercie		Sabian		Sanscript	90
Regulus		Remigrate		Sable		Saporous	
Reheard		Remind		Sabulous		Sapphic	
Rehearsal		Remiped		Saccade		Sapphire	
Rehearse		Remise		Sachem		Sapsago	
Reigle		Remission		Sachage		Saraband	147
Reign		Remodel		Sacker	147	Saracen	
Reigning		Remold	128	Sacrament		Sarcasm	
Reject		Remolding		Sacred		Sarcenet	
Rejectable		Remora		Sacrifice		Sarcology	49
Rejoice		Remorate		Sacrilege		Sardine	
Rejoicing		Remord	128	Sacristan		Sardonix	75
Rejoined		Remorse		Sacristy	153	Sasafras	
Rejolt		Remorseful		Sadden		Satan	
Rejourn		Remote		Saddle		Satanic	
Rejudge		Remotion	131	Saffron		Satanical	
Rejudging	119	Removal		Sagacious	156	Satanism	
Rekindle		Remphan		Sagacity		Sateless	
Reland		Remurmur		Sainted	157	Satelite	
Relapse		Renard	132	Salad	158	Satinet	105
Relapsing		Renegado		Salam		Satire	
Relate		Renovate	133	Salebrous	161	Satiric	
Related		Renown		Saleratus		Satirical	
Relation		Renter	134	Salicine	162	Satirist	
Relative		Reobtain		Saliferous		Satirize	
Relator		Reordain		Salifiable		Satrapal	
Relax		Repand		Saline		Satrapy	
Relaxable		Repartee	135	Saliva		Saturate	
Relaxant		Repäss		Salivary		Saturn	
Relaxed		Repasture	136	Salivate	165	Saturnist	
Relaxing		Repealed		Sallow		Saturnite	
Relay		Repedation	137	Sally		Satyr	
Release	121	Repellent		Salmagundi		Satyrion	13
Relegate		Repeople		Salisfy		Sauter	
Relent		Repercuss		Saltant		Sauria	
Relented						Sauroid	
						Sausage	
						Saussurite	



Trade Word.	Page.	Trade Word.	Page.	Trade Word.	Page.	Trade Word.	Page.
Savable	13	Tabulate	159	<b>W.</b>		Wharfage	160
Savage		Teraph	13	Wanton	178	Whang	
Savagery		Teraphim		Wantonize		Wharf	
Savagism	14	Tercine		Waped	179	Wicken	
Savant		Teredo		Wapiti		Wicket	
Savin		Tergum		Wappe		Widgeon	
Sawyer		Ternifee		Wapper		Wig	
Saxatile		Terminer		Warble		Wigwam	
Saxicavous		Terminus		Warbler	180	William	188
Saxifrage		Terminthus		Ward		Willemite	163
Saxon		Termite		Warder		Willow	
Saxonism		Termor		Wardrobe		Wimble	
Saxonist		Termagancy		Warfare		Winch	
Scabbard		Termagant		Warfield		Windage	
Scaffold		Terminal		Warhoop		Window	
Scalado		Tennis	14	Warhorse		Winker	149
Scalariform		Tenon		Warlike	181	Winking	
Salary		Tenor		Warned		Winner	
Scaldic		Tenrec		Warproof		Winnow	
Scamper	152	Tension		Warrior		Winter	120
Scatter		Tensive		Watchword	182	Winzle	
Scattering		Tensome		Watchful		Wiper	
Streek	156	Tensor		Watch		Wisdom	
Street		Tensure		Waver	184	Witch	
Streetview		Tented		Wearable	183	Witticism	
Streetward		Tenter				Wizard	
		Tenting				Wizen	
		Tenuity					
		Tenuous					
		Tenure					
<b>T.</b>							
Tabular	159						



## INDEX TO LIST NUMBERS.

Trade No.	Page.	Trade No.	Page.	Trade No.	Page.	Trade No.	Page.	Trade No.	Page.	Trade No.	Page.	Trade No.	Page.
56	10	271	13	338	16	499	86	740	102	865	126	1076	6
59		271 A		339		500		741		866		1077	
62		272		340		515	742	867		1078			
65		272 A		341		516	743	868		1079			
68		11	273	342	517	744	869	1080		103			
71			273 A	343	518	745	870	1081					
74			274	422	519	746	871	1082					
80			274 A	433	520	747	872	1083					
86			275	434	521	748	873	1084					
89			275 A	435	522	749	874	1085					
92	276		436	523	750	875	1086						
95	276 A		437	524	751	876	158						
98	277		438	525	752	877		1095					
101	277 A		439	526	753	878		103					
104	278	440	527	754	879	1119							
107	278 A	441	574	755	880	1120							
110	11	279	442	575	756	881	1121	159					
113		279 A	443	576	757	899	131		1134				
116		280	444	577	758	882	126	1135					
119		280 A	445	654	759	900	131	1157	97				
122		281	446	655	760	901		1158	98				
125		281 A	447	656	761	902		134	1221	95			
131		282	448	657	762	903	1222						
137		282 A	449	658	763	904	1223						
143		283	450	659	764	908	1224						
146		283 A	451	660	765	909	1225						
149	284	452	661	766	910	1226							
152	284 A	454	685	767	923	137	1227	94					
158	285	455	686	822	924		1228						
164	285 A	456	687	823	925	138	1229		92				
170	286	457	688	824	926		1230						
176	286 A	458	689	825	927		1231						
179	287	459	690	826	928	1232							
182	287 A	461	691	827	932	137	1233	67					
185	288	462	692	828	973	135	1233½		91				
188	288 A	463	693	829	976		1434						
191	13	311	464	694	977		1435						
194		311 A	465	695	993	1436							
197		311 B	466	696	994	1437							
203		311 C	467	697	995	1438							
209		312 D	468	698	121	1054	13	1439		92			
212		312 E	469	699		840	14	1440					
215		312 F	470	700		841	1055	1441					
218		312 G	471	701		842	5	1442					
221		312 H	472	702		843		1443					
224		313 I	473	703		844		1444					
227		314 J	474	704		127	1056	6	1445	56			
230		314 K	475	705			1056 A		1447				
233		315 L	476	706			1057		1448				
236		315 M	477	707			1058		1449				
259	316 N	478	708	1059	1454								
259 A	316 O	479	709	1060	1455								
260	317 P	480	710	1061	1456								
260 A	317 Q	481	711	1062	1457								
261	318	482	712	1063	1459								
261 A	319	483	713	1064	1460								
262	320	484	714	1065	1461								
262 A	321	485	715	1066	5	1571	67						
263	322	486	716	1067		1572							
263 A	323	487	717	1068		1573							
264	324	488	718	1069		1574							
264 A	325	489	719	1070		1575							
265	326	490	720	1071		1576							
265 A	327	491	721	1072		1577							
266	328	492	722	1073		1578							
266 A	329	493	723	1074		1579							
267	330	494	724	860		128		6	56				
267 A	331	495	725	861									
268	332	496	738	862									
268 A	333	497	739	863									
269	334	498		864									
269 A	335												
270	336												
260 A	337												







Trade No.	Page.	Trade No.	Page.	Trade No.	Page.	Trade No.	Page.	Trade No.	Page.	Trade No.	Page.	Trade No.	Page.
3361		3443		3524		3604		3680		3754		3831	
3362		3444		3525		3605		3681		3755		3832	
3363		3445		3526		3606		3682	66	3756		3833	88
3364		3446	12	3527		3607		3683		3757	84	3834	
3365		3447		3528		3608		3684		3758		3835	
3366		3448		3529		3609		3684½		3759		3836	
3367		3449		3530		3610	36			3760			
3368				3531		3611		3685		3761		3837	
3369		3450		3532		3612		3686		3762		3838	
3370		3451		3533	16	3613		3687				3839	90
3371		3452		3534		3614		3688		3763		3840	
3372		3453		3535		3615		3689		3764		3841	
3373		3454		3536		3616		3690	72	3765		3842	
3374		3455		3537		3617		3691		3766			
3375		3456		3538				3692		3767		3843	
3376		3457		3539		3618		3693		3768	85	3844	
3377		3458		3540		3619		3694		3769		3845	
3378		3459		3541		3620		3695		3770		3846	
3379		3460		3542		3621		3696		3771		3847	
3380		3461		3543		3622				3772		3848	
3381		3462				3623		3697	77	3773		3849	
3382		3463		3544		3624		3698		3774		3850	96
3383		3464		3545		3625						3851	
3384		3465		3546		3626		3699		3775		3852	
3385		3466		3547		3627		3700		3776		3853	
3386		3467		3548		3628		3701		3777		3854	
3387		3468		3549		3629		3702		3778		3855	
3388		3469		3550		3630		3703		3779		3856	
3389		3470		3551		3631		3704		3780		3857	
3390		3471		3552		3632	37	3705		3781		3858	
3391		3472		3553		3633		3706		3782			
3392		3473		3554		3634		3707		3783		3858½	
3393		3474		3555		3635		3708		3784		3859	
3394		3475		3556		3636		3709		3785	86	3860	
3395		3476		3557		3637		3710	78	3786		3861	
3396		3477		3558		3638		3711		3787		3862	
3397		3478		3559		3639		3712		3788		3863	
3398		3479		3560		3640		3713		3789		3864	
3399		3480		3561		3641		3714		3790		3865	
3400		3481		3562		3642		3715		3791		3866	
3401	12	3482		3563		3643		3716		3792		3867	101
3402		3483		3564		3644		3717		3793		3868	
3403		3484		3565		3645		3718		3794		3869	
3404		3485	16	3566		3646		3719		3795		3870	
3405		3486		3567	18	3647		3720		3796		3871	
3406		3487		3568		3648		3721				3872	
3407		3488		3569		3649		3722		3797		3873	
3408		3489		3570		3649½	38			3798		3874	
3409		3490		3571				3723		3799		3875	
3410		3491		3572		3650	39	3724	79	3800		3876	
3411		3492		3573				3725		3801		3877	
3412		3493		3574		3651		3726		3802			
3413		3494		3575		3652				3803		3878	110
3414		3495		3576		3653		3727	80	3804		3879	111
3415		3496		3577		3654	43			3805			
3416		3497		3578		3655		3728	75	3806		3880	112
3417		3498		3579		3656				3807			
3418		3499		3580		3657		3729		3808		3881	113
3419		3500		3581		3658		3730		3809			
3420		3501		3582				3731		3810		3882	114
3421		3502		3583		3659		3732		3811			
3422		3503		3584		3660		3733		3812		3883	115
3423		3504		3585		3661		3734		3813			
3424		3505		3586		3662	49	3735		3814	88	3884	129
3425		3506		3587		3663		3736		3815			
3426		3507		3588		3664		3737		3816		3885	132
3427		3508		3589		3665		3738		3816½			
3428		3509		3590		3666		3739		3817		3886	133
3429		3510		3591		3667		3740		3818		3887	
3430		3511						3741	84	3819			
3431		3512		3592		3668		3742		3820		3888	140
3432		3513		3593		3669		3743		3821			
3433		3514		3594		3670		3744		3822		3889	
3434		3515		3595		3671	50	3745		3822½		3890	
3435		3516		3596		3672		3746		3823		3891	
3436		3517		3597	36	3673		3747		3824		3892	
3437		3518		3598		3674		3748		3825		3897	141
3438		3519		3599		3675		3749		3826		3898	
3439		3520		3600		3676		3750		3827		3899	
3440		3521		3601		3677		3751		3828		3900	
3441		3522		3602				3752	53	3829		3901	
3442		3523		3603		3678		3753		3830			
						3679							



Trade No.	Page.	Trade No.	Page.	Trade No.	Page.	Trade No.	Page.	Trade No.	Page.	Trade No.	Page.	Trade No.	Page.
3902	141	3917	151	3933	105	3952	105	3968	120	3985	137	5525 B	180
3903		3918		3934		3953		3969		5526			
3904		3919		3935		3954		3970		3986	184	5526 B	
3905		153	3936	3955		3971		178		5527			
3906			3920	3937		3972				5499	5527 B		
3907	3921		3938	152	3956	149	5500		182	5528			
	3922		3939		3957		5501			5528 B			
	3923		3940		3958		5502						
3908	144	3924	157	3941	105	3959	163	3975	160	5529	181		
3909	150	164	3942	3943		3960		3976		5515			
			3944	3961		3977		5515 A					
			3945	3962		3978		5515 B					
			3946	3963		3979		5521					
			3947	3964	3980	5521 B							
3910	151	164	3948	120	3965	120	3981	178	5522	180	5531	183	
3911			3949		3966		3982						
3912			3950		3983		5525						
3913			3951		3984								
3914													
3915													
3916													

B

A

D

G

E

R

LINE

M

A

T

E

R

I

A

L

LET US FILL YOUR ORDERS  
EVERY ONE YOU GIVE  
US WILL RECEIVE  
OUR UNDIVIDED  
ATTENTION

P. — AND — B.  
COMPOUND

USE "MAC" TAPE

I. X. L. WEATHERPROOF  
FEEDER WIRE

N. I. R. RUBBER  
COVERED WIRE

WE ARE  
CONSTANTLY  
ADDING TO OUR  
OVERHEAD SPECIALTIES





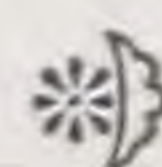












ROBERT SMITH & CO.  
STATE PRINTERS AND BINDERS  
LANSING, MICHIGAN